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JANUARY-FEBRUARY, 1941

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BIRD-LORE

Published by the NATIONAL AUDUBON SOCIETY

AUDUBON MAGAZINE

A BI-MONTHLY MAGAZINE DEVOTED TO THE PROTECTION
AND PRESERVATION OF OUR NATIVE WILDLIFE

Our Motto: A BIRD IN THE BUSH IS WORTH TWO IN THE HAND

Acting Editor, MARGARET BROOKS

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*Published at Crescent and Mulberry Streets, Harrisburg, Pa., by the
National Audubon Society*

*POSTMASTER: If undeliverable, please notify Audubon Magazine on form 3578 at
1006 Fifth Avenue, New York, N. Y.*

Vol. XLIII

JANUARY-FEBRUARY, 1941

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AUDUBON MAGAZINE is published bi-monthly by the National Audubon Society. Subscription price, \$2.00 a year in the United States, \$2.25 foreign. Single copies 35 cents. Supplements are sent free of charge to members and subscribers; subscription, 75 cents. Single copies containing 'The Season,' 15 cents; 'The Season' and the 'Breeding Bird Census,' 20 cents; 'Christmas Census' supplement, 25 cents. Notice of change of address should be received by the 10th of the month prior to issue with which it is to be effective. AUDUBON MAGAZINE regrets that it cannot continue subscriptions beyond date of expiration. Checks and money orders should be made payable to AUDUBON MAGAZINE.

Entered as second-class matter, August 6, 1900, at the Post Office at Harrisburg, Pa., under the Act of March 3, 1879.

Editorial and advertising offices, 1006 Fifth Avenue, New York, N. Y.

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AMONG THE AUTHORS

James T(aylor) Tanner (p. 5) was about eleven when he first started observing birds in central New York, following them through Cornell University with a broadening interest. His first work for the National Audubon Society was in 1936 as warden at Camp May. He had first met Ivory-billed Woodpecker the previous year, and the years from 1937 to 1940 were spent studying it in its present habitat.

Tanner is now teaching biology and zoölogy at State Teachers College, Johnson City, Tenn.

Gayle Pickwell (p. 24) is here introduced to AUDUBON MAGAZINE readers for the first time; he has long been a contributor to natural-history periodicals. The titles of his books speak for his broad interests—"Birds," "Animals in Action," "Desert Weather." This interest began in his boyhood Nebraska home, continued at Northwestern, and at Cornell University where a Ph.D. degree was conferred on him in 1927. During his four years at California's San Jose State College (Professor of Zoölogy), Dr. Pickwell has spent all his holidays photographing various forms of wild life.

Lewis W. Walker (p. 35) learned photography in the early 1920's, and the Graflex camera eventually bought is still seeing service after fifteen years. A history study of the Barn Owl (his main interest is birds of prey) was sold to "Boys' Life," with the result that he has written about 100 articles in ten years, illustrated from a collection of almost 7000 negatives.

Mr. Walker is in charge of the Preparation Dept., San Diego (Calif.) Natural History Museum.

Edward A. Hill (p. 47), by vocation a bookkeeper, by avocation a writer of poetry, essays and articles, spends his leisure hours photographing nature subjects. Kodachrome slides, about 700 in his Fleetwood, Pa., home, are used for lecturing to natural-history groups. To sum up his hobby interest in his own words: "I try to capture the spirit of a bird or flower with words, catch its form with a picture."



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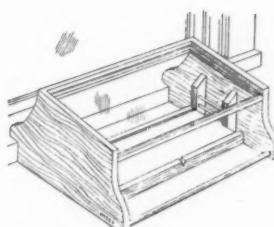
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Photo by James T. Tanner

A CONSERVATION PROGRAM FOR THE IVORY-BILLED WOODPECKER
must include maintenance of conditions providing a sufficient quantity of food, and
complete protection from man.

AUDUBON MAGAZINE

JANUARY-FEBRUARY, 1941

Three Years with the Ivory-Billed Woodpecker, America's Rarest Bird

By James Taylor Tanner

FEW living naturalists have ever seen a live Ivory-billed Woodpecker, the rarest bird on the North American continent today. In what might prove to be the twilight of the species, it has been my singular good fortune to spend three interesting years tracing its history and almost living with the scattered remnant of its vanishing clan.

The Ivory-billed Woodpecker (*Campephilus principalis*) is a big bird, larger than a Crow. It is the largest Woodpecker in the United States, and the second largest in the world, for it is exceeded in size only by the Imperial Woodpecker, a great bird much like the Ivory-bill that lives in the pine forests of northwestern Mexico. When the continent was covered by virgin timber, the Ivory-bill ranged widely through the low swampy forests of the Southeast. It was found over most of the State of Florida, from there north along the coastal plain to southeastern North Carolina, and west along the Gulf to eastern Texas; then northward in the bottomlands of the Mississippi and its tributaries to southern Illinois, eastern Oklahoma and possibly south-eastern Indiana.

With the settling of the land, the distribution of the Ivory-bill became

greatly restricted, and naturalists began to notice the growing scarcity of these magnificent birds. During the latter part of the nineteenth century, they rapidly disappeared when the forests they lived in were cut over, and the virgin timber removed. Often their disappearance almost coincided with the logging operations. In Florida, where the birds retained their hold longer than in many other places, the greatest decrease took place between 1900 and 1915.

The destruction of the bird's habitat seems to have been the most important factor in the disappearance of the Ivory-bill. It is true that some were killed, especially by the Indians, who for generations had valued the bills and crests as ornaments for their chiefs and great warriors. Audubon, in 1831, wrote that entire belts of Indian chiefs were closely decorated with the tufts and bills of Ivory-billed Woodpeckers. The coming of the white man, with his gun, added to this primitive toll, but such persecution as the bird suffered was more or less random. However, in at least one locality in Florida, a scientific collector is known to have greatly reduced or extirpated the bird, for the natives say that Ivory-bills were very



Photo by James T. Tanner

AN EXTENSIVE PRIMEVAL WILDERNESS, where there are many trees that have been dead for about two years, is demanded by the Ivory-bill because of its feeding requirements.

THREE YEARS WITH THE IVORY-BILLED WOODPECKER

rare or non-existent there after that man's activities. In the museums and collections of this country there are now probably between 200 and 250 specimens of the Ivory-bill—not a large number, but this collecting probably contributed to the extermination of the species at a time when it was already becoming rare through loss of its habitat.

Collecting and shooting have not been the major causes of the species' decrease, have not been as important as the destruction of the bird's habitat by logging. But now there are so few Ivory-bills living that the shooting of a few birds could become the final cause of their extinction. Any species reduced in numbers by one cause might be wiped out by a totally different agent, perhaps even an accidental one, killing the last breeding individuals. This could easily happen to the Ivory-bill.

For a few years after 1926, many reputable naturalists considered the Ivory-bill to be extinct, as none knew of any living birds, but in April, 1932, a few were found still existing in Louisiana, and later, a few in South Carolina.

The discovery that the Ivory-bill was not yet gone aroused a hope that the species might be saved, if only a sufficient understanding of its needs could be determined. In the hope that this information might be obtained, the National Audubon Society established, at Cornell University in 1937, a temporary fellowship for the study of this bird. It was known as the Audubon Ivory-billed Woodpecker Research Fellowship, and was organized and administered on the same plan as other fellowships at the university. The writer was appointed to the fellowship by the University faculty on the nomination of Dr. Arthur A. Allen, Professor of Ornithology, who has supervised the

investigation. For the support of the fellowship the National Audubon Society paid \$1500 to Cornell in each of three years, the funds being used for the expenses of the research, and the traveling and living expenses of the appointee. During the investigations, reports were made through Professor Allen to the National Audubon Society on the progress of the work, and the total findings were organized into a 300-page thesis which was presented for the degree of Doctor of Philosophy. This article will merely touch on a few of the things that will be of most interest to readers of *AUDUBON MAGAZINE*.

Much of my work had to be done in the range and haunts of the bird, and extended trips were taken throughout the South to visit places from which Ivory-bills had been reported, to examine localities where they once lived, and to search for new areas. Altogether I investigated at least forty-nine different areas, traveling about 45,000 miles by car and train, and uncounted miles on foot, horseback, and by boat.

At the start of the investigation two Ivory-bill localities were known—the Singer Tract in Louisiana and the Santee swamp in South Carolina. Besides these two records, there were rumors of the birds being in other places. Searching for possible new Ivory-bill territory and hunting for the birds consumed about eight months in the field.

The most promising areas were examined for Ivory-bill 'sign'—the sign the birds make when feeding and the holes they chisel. Ivory-bills do most of their feeding on recently dead trees, chipping off the bark to uncover borers that live between the bark and sap-wood. This 'sign' shows as bare wood on limbs and trunks, where the bark has been scaled off. The holes that Ivory-bills dig for nesting and roosting have an oval or irregular entrance measuring about 5 inches vertically and

4 inches across. This is about an inch larger than the Pileated's entrance-hole. By far the majority of the areas that were examined had neither enough suitable habitat to support Ivory-bills, nor any kind of 'sign.'

Early morning is the best time of the day to look for the birds, as they are then active, and move or call more frequently. All the Ivory-bills I have ever seen were located first by hearing them call. The Ivory-bill's voice resembles very much that of a Red-breasted Nuthatch, only, of course, much louder. The bird usually utters single or double yaps, *kent, kent-kent, kent*; another common call is a more prolonged upward-slurring *kient-kient-kient*.

The Ivory-billed Woodpecker is a distinctive bird, easily recognized by those who know it. Yet it is so often confused by the layman with the smaller and commoner Pileated Woodpecker that many reports of Ivory-bills were found to be merely mistaken identifications. In flight, the Ivory-bill looks surprisingly like a Pintail Duck. Its neck is long and slender, its tail long and tapering. The position of the white on the wing is by far the best field character at all times. The white is on the rear half of the wing, conspicuous in flight, and visible on the back when the bird is perched. In the Pileated, the white runs through the center of the wing and is hidden when the wings are folded.

About five areas in Louisiana, Florida, and possibly South Carolina were found to be inhabited by the Woodpecker, or to have evidence of its presence. The total population I estimate to be a possible twenty-four individuals, although I, personally, did not see more than five, all of which were on the Singer Tract in Louisiana. The estimate of the others is based on the location of recent reliable reports

and the carrying capacity of these locations.

Judging from the available records, the maximum abundance of the Ivory-bill is estimated to have formerly been one pair of birds to about 6 square miles of suitable habitat. On the Singer Tract the density is considerably less than this, with about one pair per 17 square miles during the peak year (1934). One pair per 6 square miles is probably close to the maximum original density, for in the Singer Tract a pair of Ivory-bills in the nesting season ranged over an area of about that size.

I made a comparative count of other Woodpeckers in the same environment, and found that the density of Pileated Woodpeckers was six pairs per square mile and the density of Red-bellied Woodpeckers about twenty-one pairs per square mile. The relative abundance, then, would be 1 Ivory-bill to 36 Pileated Woodpeckers or to 126 Red-bellied Woodpeckers.

When the food supply is sufficient, the Ivory-bill is probably resident or sedentary, with a feeding range from 3 to 4 miles across. There is considerable evidence that pairs or individuals sometimes move long distances in search of forests that have an adequate quantity of food. Some of the birds in the Singer Tract have remained in one locality for several years, but there they are almost confined by the cut-over condition of the surrounding country. There are records in Louisiana, Florida, and South Carolina which can be most easily explained as being observations of wandering birds. The Ivory-bill is a strong flier with a fast flight for a Woodpecker, and is well adapted to traveling long distances. They usually travel in pairs, the two birds moving closely together. Considering their rarity, this is important in order that mates may keep together.

The Ivory-bill's habitat outside of

THREE YEARS WITH THE IVORY-BILLED WOODPECKER

Florida is the bottomland forests where sweet gum and oak predominate. In and near Florida it is in cypress swamps and swampy hammocks. One condition is characteristic of all Ivory-bill habitats, namely that other species of Woodpeckers, like the Pileated and Red-bellied Woodpeckers that inhabit a variety of woods, reach their greatest abundance there. The Ivory-bill by virtue of its size and strength is able to reach a supply of food not easily accessible to the other Woodpeckers, so it has no real competitors among them.

The primary food of the Ivory-bill is wood-boring insect larvæ, particularly cerambycids, buprestids, and elaterids that live between the bark and the sap-wood of recently dead trees. These it digs out energetically, chopping the hard, tight bark loose with sidewise blows and quick flicks of its powerful bill. It feeds primarily on the larger trees of the forest, 87 per cent being trees that have trunks over a foot in diameter, even though many of the trees in the same forest are less than this size. In 70 per cent of my observations in Louisiana, the birds scaled the bark from the trees; the remainder of the time they fed by digging into the sap or heartwood for deeper living borers. Ivory-bills also occasionally feed upon fruits, nuts, and seeds, but these are not as important as are insect larvæ.

When a tree dies, the insects that live beneath the bark are the first to reach their peak of abundance. This happens usually about two years after the death of the tree, and then these borers soon decrease and disappear. They are followed by grubs that bore into the slowly decaying wood until the tree is almost completely rotted away. The Pileated Woodpecker feeds on this latter kind of borer, so it can dig food from a tree until it has nearly returned to earth; but the Ivory-bill can find its preferred food in a dead tree or limb

for but a short time. For that reason, its food supply is limited. This is without question the most critical factor controlling the fortunes of the Ivory-bill. It is hard to imagine more specialized needs—an extensive primeval wilderness where there are many trees that have been dead about two years!

Wood-boring insects are plentiful only where there is a large number of dying or dead trees such as is caused by fire or storms, or when, by coincidence, a large number of trees begin to weaken and die at the same time from old age. Such deaths of timber causing outbreaks of borers occur irregularly and are likely to be widely scattered, since they are in the nature of accidents. The Ivory-bill must, of necessity, be a wide-ranging species if it depends for existence on such unusual numbers of borers. Instances have occurred where timber has been killed by storm, fire, or logging operations, and the Ivory-bills have lived in the vicinity of these 'deadendings' only during the period when boring insects, especially those that live beneath the bark, were most abundant.

In Florida and the southeastern states much Ivory-bill feeding was done in fire-killed timber. The long-leaf pine requires fire for successful seeding and regeneration, and its evolution therefore must have been shaped by fire. Fire probably was the most important agent of timber death for a very long time, and Ivory-bills living in mixed swamp and pine forest in the southeastern states probably fed to a large extent in timber killed in this way.

Cutting the forests of the South removed the large old trees which produce most of the Ivory-bill's food, and made vast areas extremely unsuited to them. The isolation of large forests has made it increasingly difficult for the bird to move from one area to



Photo by James T. Tanner

THE IVORY-BILL'S HABITAT IN LOUISIANA IS THE BOTTOMLAND FORESTS
where sweet gum and oak predominate. Its nest hole, indicated by arrow, is usually about
40 to 60 feet from the ground.

THREE YEARS WITH THE IVORY-BILLED WOODPECKER

another in search of a food supply that has always been more or less eruptive and undependable.

There are no records or known observations of Ivory-bills being attacked by predators of any kind. The size of the Ivory-bill, and its alertness and aggressiveness in driving Hawks away from the vicinity of young or nests seem to be adequate protection from these birds of prey; its habit of roosting in holes probably protects it from attack by Owls. The only common large Owl in its range is the Barred Owl. For the first few nights after leaving the nest, the young birds roost in a rather exposed position where they could be attacked by Owls, but this did not happen to any of the young birds I watched. The Ivory-bill's habit of feeding and living almost its whole life in and near the tops of trees makes it very unlikely that any mammal could catch one. Only rarely does an Ivory-bill come close enough to the ground to be within reach of a bobcat or other prowling creature. On the whole, predators play very little part in the ecology of the Ivory-bill.

The Ivory-billed Woodpeckers in the Singer Tract of Louisiana, where I made all of my observations on the behavior of this species, have fairly definite patterns for their daily activities. They roosted singly in holes, and very frequently used the same hole night after night; one pair of birds used the same roosting ground for three years. They apparently do not use old nesting cavities for roosting, but dig others for this purpose.

The Ivory-bill was almost the last bird of those woods to arise in the morning. During the springtime, smaller birds started singing before daylight; but sometimes the sun had lighted the treetops before the Ivory-bills emerged. After leaving its roost hole, the bird would climb to the top

of the tree where it would sit, preen and stretch. After a minute or so, it would call. Frequently its mate would answer, and then one bird would fly to join the other. If there were young of the year present, all the birds would soon get together and start off for feeding. They frequently flew above the treetops, but more often below them, dodging the trees with very little deviation from their course. The stiff, hard wing-feathers make a fluttering sound, so loud and wooden that I often nicknamed the birds 'Wooden-wings.' Their flights in the early morning were usually rather long—up to a quarter of a mile. It taxed a man's legs and wind to keep up with them. After they had traveled about a half mile, they would take more time for feeding. Near 10 o'clock in the morning, they would become quiet, almost cease feeding, and do little but sit around during the middle of the day. Around 3.30 in the afternoon, they usually became active again, working gradually in the direction of the roosting ground, which they reached about sunset. After dallying about until dusk, they would separate and quietly go to roost.

Although, like other birds, Ivory-bills may appear to have nesting territories, there is no evidence of their defending such claims from other Ivory-bills; in fact, a neighboring pair of Ivory-bills once came into the area occupied by the pair I was watching on the Singer Tract, but there was no suggestion of fighting or antagonism by any of the birds—only indifference. To my knowledge, the closest that Ivory-bills have nested in the Singer Tract is about three miles, although it is likely that nests have occurred nearer than this because the feeding ranges of different birds have occasionally been adjacent.

No matter what the season, Ivory-bills have almost always been observed

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Photo by James T. Tanner

RAREST OF NORTH AMERICAN BIRDS. This nestling Ivory-bill, photographed twelve days before leaving its nest, is part of a total population not exceeding twenty-four individuals.

THREE YEARS WITH THE IVORY-BILLED WOODPECKER

in pairs, indicating that they do not separate during the non-breeding season. They probably mate for life. The courtship is a brief ceremony, consisting of touching or clasping bills, sometimes accompanied by low calls.

Ivory-billed Woodpeckers breed at varying times from January to May. The number of eggs laid in a set usually varies from 1 to 4, averaging 2.9. The number of eggs and young have been smaller in nests begun in January or February (1 or 2) than in nests begun in April or May (3 or 4).

Ivory-bill nests are excavated in living or dead trees usually about 40 to 60 feet from the ground. In Florida they have preferred cypress, but in Louisiana they have nested in a variety of hardwoods. The nest entrance usually measures $4\frac{1}{2}$ inches wide by $6\frac{1}{4}$ inches from top to bottom. The cavity is generally about 19 inches deep.

The incubation period is judged to be about twenty days, although there is no definite record of the exact time. The male stays in the nest overnight, and during the day alternates on the nest with the female. The birds generally exchange places eight times a day. Young birds remain in the nest around five weeks. They are fed regularly by both parents, about thirty times a day at first, decreasing to fifteen as they grow older. The male parent broods them overnight and does most of the brooding in the daytime. The male also cleans the nest.

After leaving the nest the young birds apparently never return to it for roosting. For the first few nights they stay in the open, clinging to a trunk, a limb, or the leafy top of a tree. The earliest I have ever seen a young bird use a roost hole was two weeks after its departure from the nest.

Young birds accompany their parents on feeding trips and are fed by them for two months or longer. Three months

after leaving the nest they can find food regularly for themselves and soon afterward can become independent. They usually leave or are driven away by the following spring, but the single young male that was raised by the pair I was watching in 1938 stayed in that territory through the following nesting season. The female of the pair frequently tried to drive him away, but he would only dodge, sulk, and return. The old male paid little or no attention to his yearling son.

The Singer Tract is the only area where enough observations have been made to warrant drawing any conclusions about the nesting success of the Ivory-bill. The fates of six nests in this tract are known. Three of these nests were successful in raising one young each. I examined these three nests soon after the young birds had left, and there was nothing that would indicate that more than one egg or young had ever been in any of them. In the other three nests something destroyed the young soon after they had hatched. What happened remains a mystery, but one of the three nests was found to be literally alive with mites.

Since 1931, at least 19 young in nine broods have been observed out of the nest in the Singer Tract. These broods have averaged 2.11 young, but 78 per cent of the time broods of only 1 or 2 have occurred. The nesting success of the Ivory-bill is approximately the same as that of the Pileated in the same area, and is close to Mrs. Nice's figures for the Song Sparrow, but the Ivory-bill does lay fewer eggs and so rears fewer young. Ivory-bills will sometimes nest a second time if the first nest with eggs is broken up. The rate of reproduction for the Ivory-bill may be lowered by the occurrence of non-breeding birds, but little is known about this.

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My study revealed only two factors that have definitely affected the numbers and distribution of the species—their being shot by man and the quantity of food available to the birds; the latter, I believe, has been the one responsible for the Ivory-bill's near extinction. Predators and competitors have very little, if any, influence. Although it usually raises small broods, the Ivory-bill is as successful in its nesting as are other birds; reproduction apparently has not been the agent limiting its numbers.

A conservation program for the Ivory-billed Woodpecker must include first the maintenance of conditions providing a sufficient quantity of food. The forester tries to prevent fires and urges the cutting of trees before death and decay damage the wood. This means that conditions favorable to the Ivory-bill will never again become widespread, for they are exactly what the forester tries to avoid.

The general health of the timber in the Singer Tract has improved within the last few years, and the population of Ivory-bills has decreased. It still has the densest Ivory-bill population of any area in the country, and is the only locality where we have enough accurate knowledge to plan a definite conservation program. Preservation of the entire tract would, of course, be the ideal, but that may not be possible because of the high market value of the timber stand. If this cannot be done, a program of selective or partial cutting is recommended, whereby only sound and healthy trees would be cut in areas to be selectively logged, leaving the dying trees to supply Woodpecker food; and certain reserve areas would be left untouched as nuclei of Ivory-bill ranges and as examples of virgin forest. The outline of such a program has been worked out in some detail.

The amount of Woodpecker food can be artificially increased by girdling

or otherwise killing trees. This can be done so as to improve the timber stand at the same time, by killing defective or 'undesirable' individuals, trees that are crooked, species with low timber value, or crowded groups that need thinning. I have experimented with girdling and fire and have been successful at least part of the time in killing trees so that they became inhabited by borers.

The Ivory-bill must be accorded complete protection from man by the barring of all hunters and collectors from areas inhabited by the Woodpecker. A man hunting for squirrels can be as dangerous as a collector after Ivory-bill specimens.

The Big Cypress region of southern Florida and the lower Apalachicola River swamp in the northwestern part of that state are the most promising areas for the preservation of the Ivory-bill outside of the Singer Tract. The Big Cypress region is close to the boundaries of the proposed Everglades National Park, and I, for one, strongly recommend that as much of it as possible be included in the proposed park. As there is no immediate danger of timber-cutting on these tracts, the policy to be pursued in Florida should be one of watchful waiting.

The Santee region of South Carolina is being turned upside down at this time by the Santee-Cooper project. Assuming that no change occurs in the forest in the lower reaches of the swamp, the Wadmacaun Island section will be the best Ivory-bill habitat remaining in the Santee bottoms after the completion of the power project. The whole Santee area should be watched as it is changed by the construction and operation of the Santee-Cooper project, to see if Ivory-bills appear in any section, and if so, if anything can then be done to hold and protect them there.

America's Greatest Bird Concentrations

By Ira N. Gabrielson

Director, Fish and Wildlife Service, Department of the Interior

PART II

TRAVELING by night and visiting bird colonies by day, I worked my way westward through the Aleutian Islands with an inspection party in the summer of 1940.* We managed to land on one or more of the islands nearly every day during the outward trip, and on the return journey visited some of those missed before. Thus we got a good idea of the bird colonies, although it would take many weeks to find and become acquainted with all of them.

The plan followed gave us a fine opportunity to see the various types of islands and to learn something of the problems presented by the fox industry, the birds, the native communities, and the interrelationships among all of them. While learning, we were entertained by a constantly changing panorama of geological formations and spectacular bird life.

One of the great bird colonies that we visited was on Kasatochi Island. We landed there about six o'clock one afternoon and in this high latitude still had several hours of daylight ahead of us. Kasatochi is a formidable island with sheer cliffs rising straight out of the water. It is reported to have a perfect crater in the top, and we all started to climb up to it. Some of the party went all the way, but I became so fascinated with the Auklet colony that I never did get more than a thousand feet above the water. It was here that we first saw the Least Auklet, which to

me provided one of the most spectacular shows of all of the sea birds. This island and St. George, in the Pribilofs, were the two where we saw the Least Auklet in the most incredible numbers. St. George is larger and therefore probably had the larger number, but no single day's observations could settle that point. On both there were simply more birds than a person could realize in a few hours' visit. Mixed in the concentration were Crested Auklets which alone would have made a great bird colony of their own but which here were almost unnoticed among the tremendous numbers of Least Auklets. As I climbed the rockslide and heard these little birds chuckling and talking to themselves as they came out of their nesting crevices, I became greatly interested in them. They were absurd-looking little fellows, not much larger than the English Sparrow, with a spotted sooty and white breast and enough scattered white bristly feathers around the eyes to give them an Owl-like appearance. They stood solemnly upright on a rock and looked at me with first one eye and then the other. I never got over being amused by their appearance.

As the Auklets leave their nesting holes under these rocks, they walk out to a projecting rock and pitch off head first with both wings in full motion. By the time they reach the bottom of their slide through the air, a thousand feet or more below, and flatten out to dart over

*See Dr. Gabrielson's previous article in *BIRD-LORE* for November-December, 1940.

the water, they are going at a phenomenal speed. An aviator might have learned power diving by watching these experts. Certainly they have perfected the power dive to the point where they can level off only a matter of inches above the surface of the water, and shoot out over it like projectiles from a gun.

As the sun sank toward the horizon these birds began to leave their nests in increasing numbers and to fly out over the water in front of the great slides that harbored the colony. There were flocks of thousands, each a swiftly moving ribbon or patch against the sky, twisting and turning in their evolutions like Sandpipers. The flocks played around and over each other until the air seemed awhirl with birds. Sometimes one long ribbon would cross another, both undulating as they went and alternately showing white and dark in the sun.

As it became a little darker, one after another of these great flocks came sweeping with a roar like a waterfall over the rock where I was sitting. The flocks passed overhead, but hundreds of individuals dropped like falling leaves to land all around me on the rocks, some of them within a few feet. As I remained perfectly still, a great many of them, after looking over this new feature in the landscape, decided it was no more harmful than the other humps of rock and went about their business. Some took off again to join one of the flocks, but most of them stood quiet for some time, looked around, and finally disappeared into their burrows.

There are other birds besides the Auklets on Kasatochi—many of them. I saw three Duck Hawks in the air at one time, but the Auklet colonies, consisting of Least, Crested, and Paroquet Auklets with the Least in by far the greatest numbers and the Paroquet in the fewest, so fascinated me that I am afraid I did not see as much of the other

bird life as I should have. This experience of watching the flight of these birds and their behavior on the rocksides is one of the unforgettable memories of a lifetime spent in watching birds. I wouldn't have missed it for a great deal.

En route westward we stopped at Tanaga Island, a locality where Superintendent Douglas Gray of the Aleutian Islands Refuge, knew there were some sea otters, and sure enough there they were. We saw perhaps twenty or twenty-five, nearly all females with young which they carried around as human mothers do their babies. Each mother otter swam on her back and held the baby first in one arm and then in the other as she lay on the water or paddled around at a safe distance from our little boat. Several times we succeeded in maneuvering the boat so as to get within a few yards of one of the animals and obtain a good view.

There were no concentrations on this side of the island but interesting lots of nesting birds almost everywhere, as seemed to be true in all of this incredible country. We landed on a rocky point to stretch our legs after being cramped for several hours in the small boat. It had been somewhat chilly, and we were all stiff and cold. I had seen an Eider Duck sitting on a rock off the end of the point, and I decided to explore a bit, hoping to find one of their nests. Much to my surprise in a few hundred yards I ran across a nest of Black Oyster-catchers with two newly hatched young and a third egg pipped; two of Glaucous-winged Gulls with eggs; one of Arctic Terns with eggs; and eight of Eider Ducks with one to eight eggs each. On this island I saw our first Aleutian Sandpiper in the Aleutian Islands, although we had seen numbers of them on the flats of the Alaska peninsula where we had landed earlier. Here, on one little rocky point, there were enough exciting ornithological experiences to make sev-



Photo by Fish and Wildlife Service

**WE TRIED TO ESTIMATE THE NUMBER OF MURRES ON WALRUS ISLAND,
but gave up after finding that the most conservative estimate would run into the millions.**

eral red-letter days for an appreciative birdman.

The westernmost visit we made in the Aleutians was at Amchitka Island, where we went primarily to learn about sea otters and to talk with the two guards stationed there. Because of the direction of the wind it was necessary for us to land on the side of the island opposite the sea otters' location, and hike six miles across the island in a cold wind and drizzling rain. Among other things I had been anxious to see on these islands were the Ptarmigans. In this we were not too successful, although we did see two on Amchitka. The Aleutian Sandpiper, far western cousin of the Purple Sandpiper, and the Alaska Longspur were by far the most abundant birds in the flat wet tundra that we crossed. There were some Ducks about but they were mostly so wild we could not get close enough in the foggy,

murky weather to identify them. We saw a few Eiders and a few European Teals, however, besides a number of Pacific Kittiwakes and a pair of Common Loons on a tiny lake near the cabin where the guards live. Like all the others, this island was covered with wild flowers. It certainly seemed strange to see so many alpines growing just above the wash of the waves. The northern tundra harbors many species of plants, including representatives of almost every genus that we look upon as alpines in the States.

From Amchitka we turned back, rather regretfully passing up what the reservation superintendent described as still greater colonies of Auklets than those we had visited, but the time allotted for the entire trip would not permit travel any farther west.

Starting back, we encountered our only bad storm and for a day and two



Photo by Laidlaw Williams

SEA OTTERS WERE FOUND AT TANACA ISLAND. This photograph of the famous California herd shows them in their most typical posture—floating on their backs.

nights were decidedly uncomfortable. On our one stop during this period, we landed on the west side of Atka Island and walked across it, while the boat went around to pick us up at the native village of Atka. We saw the usual land birds and along the shores of the bay small numbers of such species as the Pacific Kittiwake, Ancient Murrelet, Horned Puffin, Tufted Puffin, and Harlequin Duck. Although Murres were also present, they were not as abundant as in most of the region. We came upon them in hordes again at Kagamil Island of the Four Mountain group. Here we found an enormous number of Auklets, mostly Crested, although we did see several hundred Whiskered Auklets, the rarest

of the Auklets found in the Aleutian Islands. One of the three great Murre colonies extended for two miles or more along a gigantic cliff, every crevice and ledge of which was lined with Murres. It was impossible to estimate the number of the birds, which certainly ran into the hundreds of thousands.

A neighboring island evidently sheltered an equal or larger colony of Tufted Puffins, as we could see them coming and going in great numbers. We did not, however, have time to visit it.

The outstanding bird features of the Four Mountain group were the great aggregations of California Murres and the hundreds of Whiskered Auklets, tiny and dusky little fellows combining

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the characters of Cassin's Auklet and the Crested Auklet. They have a white belly like the Cassin's, but a crest and dark back like the Crested Auklet. They behaved much like the other species, flying in compact flocks that darted and twisted as do migrating flocks of Sandpipers, but scattering out somewhat when feeding on the water. As the boat approached, each bird would dive, often to emerge in full flight.

After visiting several other places we finally reached St. George Island, the southernmost of the larger islands in the Pribilof group. For miles before we reached it, the air was full of circling birds, mostly Auklets, and the water was covered with them. I believe that from the village on St. George Island where we watched their swarming myriads, we were looking at the greatest numbers of birds that we saw at one time anywhere on the entire trip.

Back of the village of St. George there is an old volcanic ridge, honeycombed with crevices and holes, that for several miles forms the backbone of the island, and it seemed to be literally full of nesting Least and Crested Auklets. Seen from where we stood in the village, their numbers in the air were comparable only to the enormous swarms of Blackbirds that are sometimes observed in the Mississippi Valley and on the Gulf coast. In one view we saw not only one but a dozen vast swarms of them coming and going from their feeding grounds. Along the summit of the ridge they were like bees around a hive. As far as we could see, the water was covered with these birds, and the air above it was filled with them. How many hundreds of thousands there may be on this island I cannot say, but they must form one of the greatest concentrations of bird life in the world.

At St. George we first saw the beautiful Red-legged Kittiwakes and were told that there were huge nesting com-

munities of this species on the north end of the island about five miles from the village. I did not have an opportunity to visit these colonies, but I saw Red-legged Kittiwakes in considerable numbers on both this island and on St. Paul, another of the Pribilofs. In fact, every species of sea bird native to this region seemed to be on St. George. Paroquet Auklets were there in numbers, although limited when compared with the others. There were Pacific Kittiwakes, Glaucous-winged Gulls, Red-faced Cormorants, Pallas's Murres, Pigeon Guillemots, Pribilof Sandpipers, both species of Puffins (although neither was exceedingly abundant), and at least one pair of Long-tailed Jaegers. We spent one day here and three days on St. Paul, watching the handling of the seal herd, which is an interesting story in itself.

St. Paul had no show of birds to compare with the spectacle at St. George. I think if I were to choose just one place to go to see a great bird colony I would select St. George because of the number of birds present and the ease with which they may be observed. With its Pribilof Sandpipers and its many sea birds, rare in the experience of most ornithologists, and with Aleutian Rosy Finches and Pribilof Snow Buntings as common dooryard birds, St. George has all the makings of a first-class ornithological observatory—a paradise for the most exacting student. Most of the species that were present on this island live also on St. Paul; in addition, I saw three or four Pacific Godwits, the only ones noted on the trip.

After leaving St. Paul, we visited Walrus Island, a flat-topped rock of about seventy-five or eighty acres just above ordinary storm tides. As we approached, this rock seemed to be covered with birds. About twenty-five acres in the center were occupied by Glaucous-winged Gulls, with a few Glaucous Gulls mixed in. The rest of

the island was a solid mass of Murres—Pallas's in the greatest majority. There may have been some Californias present, but I did not detect more than one individual that could be surely identified as this species. I tried to make an estimate of the number of Murres but finally gave it up after I found that even the most conservative estimate ran into the millions. Each bird, sitting soberly upright with a single egg between its feet, represented only half of the family; the other half was among those that covered the water about the island as far out as we could see from the low vantage point we occupied. Scattered over this island were upright rocks, each of which supported one or more Cormorant nests. The faces of the low cliffs of Walrus Island were occupied by Pacific Kittiwakes and Murres, which nested on the ledges and in the crevices, as well as on the tops of the rocks. Among them were a few Horned and Tufted Puffins and a very considerable number of Paroquet Auklets—the only Auklets, except a lone Least Auklet, that we noted here. But it was the Murre and Gull concentration, the largest we had seen, that gave the tone to the bird rookeries of this island. On one side there was a big sea-lion colony of several thousand animals, and the rocks just above the wash of the tide were covered with small groups of them.

From here we went directly to St. Matthew Island, a refuge area that had not been visited by a Fish and Wildlife Service representative in several years. It was originally set aside as a fox breeding area on the basis of reports which indicated that many Arctic foxes came there over the pack ice and remained to breed. We found a fair breeding population of foxes on the island. St. Matthew is a peculiar island and is, I suspect, much larger than existing charts would indicate. We spent two days checking over the area and learn-

ing something about its wildlife and plants. The feature that impressed me above all others was the Pacific Fulmar colony that existed almost without a break for something like five miles along the cliffs on the south end of the island. There were also many other birds. Paroquet Auklets were exceedingly abundant; in fact, the farther north we came the more of this species we saw. Horned Puffins were abundant, but we noted only one or two Tufted Puffins around St. Matthew and none at this particular colony. Pelagic Cormorants were the only birds of their genus that we saw in this area, although I looked carefully for the Red-faced species. The enormous sea-bird colony alone is sufficient justification for maintaining St. Matthew as a refuge. It is, I believe, the largest Pacific Fulmar concentration that we have on any Federal reservation. Both Superintendent Gray, of the Aleutian Refuge, and Capt. Sellevold, of the *Brown Bear*, say that this Fulmar colony is larger than any in the Aleutians. It certainly is greater than any we saw, although we did not visit all that are known. In addition to the birds already mentioned, there were considerable numbers of Pallas's Murres and a good population of three species of Duck, namely the Harlequin, Pacific Eider, and Old-squaw. There also was a fair breeding population of Northern Phalaropes and Pribilof Sandpipers, which were just as abundant here as they were on the Pribilofs.

Last but not least among the common birds was the McKay's Snow Bunting, which alone was worth the trip to St. Matthew. It is pure white except for a little black on the wings and tail that is not readily visible as the bird sits on the rocks or snowbanks—a beautiful species. We approached the island and hunted for a landing place in the surf, which seemed to be rough everywhere in this part of the world. Finally, we located

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Photo by Fish and Wildlife Service

A YOUNG PACIFIC KITTIWAKE ON CHISIK ISLAND. A cliff on this island supported a rookery of Kittiwakes at least two miles in length.

a cove between two projecting rocks that seemed to be a little quieter than the rest and headed into it, and landed directly under a great snowbank that had been cut out by the waves enough to expose a little beach. As I got out of the boat, I wondered where we would see the first McKay's Snow Buntings, as this is one of the two islands on which it is known to breed. Hearing an unfamiliar song, I looked up at my first bird of this species, sitting on the edge of the snowbank not twenty feet away. This Snowflake proved to be common, and we saw hundreds, from newly fledged young to the clear white old males and the less attractive females.

We saw plenty of Alaska Longspurs and what I suspected to be a Kennicott's Willow Warbler, although I did not get a good look at it. In a big meadow on the north end of the island I saw a pair of Cranes, presumably Little Brown Cranes. On this same meadow there were also a pair of Long-tailed Jaegers and a youngster that could barely fly. The great thrill of this island, of course, was the McKay's Snow Bunting, but another was the enormous bird colony around the great cliffs at the southern end. This was one of the most spectacular colonies observed on the entire trip, but special note of this concentration does not imply that there were few or



Photo by Laidlaw Williams

ALL MAJOR BIRD COLONIES IN ALASKA ARE PROTECTED. The California Murres and Brandt's Cormorants shown here are but an infinitesimal part of this greatest concentration of wildlife in North America.

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no birds on other parts of the island. On the contrary, we did not approach any part of the shore of St. Matthew without seeing communities of sea birds. Puffins, Murres, Glaucous Gulls, Pacific Kittiwakes, Guillemots, and Harlequin Ducks were everywhere.

The same thing was true of Hall Island. The southern and western sides of this island were sheer cliffs, and on the north we found one apparently feasible place to land. However, when we tried to go ashore the heavy surf prevented, and we finally gave up. This is a much smaller island than St. Matthew and is separated from it by three or four miles of strait through which rough waters surged all of the time we were there. Here were the last great bird colonies we visited in Bering Sea.

Some weeks later, as we went up Cook Inlet toward Anchorage, we were privileged to see one more large concentration of birds—the largest colony of Pacific Kittiwakes that we found on the trip—on Chisik Island, part of the Tuxedni Refuge. A cliff extended for miles along the southern part of the island, supporting a rookery of Kittiwakes at least two miles in length. Like all the other Kittiwake colonies, it had the usual accompaniment of Murres, Glaucous-winged Gulls, and other species.

The principal impression that I got from all these great concentrations of bird life was that if anywhere in the world there is a paradise for seafowl it is in these Alaskan waters. One was forced to think of the enormous amount of food required to keep these birds for a single day; the seas must teem with it. The natives eat a great many of these birds and their eggs, but the number they take is so small compared to the total that it makes no impression.

Some of the colonies of certain types of birds in the Aleutians, however, have been all but exterminated by foxes.

Some of the so-called fox farms have been abandoned, but considerable numbers still exist and the foxes on some of the islands have been making inroads on some of the nesting birds. Under the present policy of the Fish and Wildlife Service, these more valuable breeding islands will be taken out of fox production and the industry restricted to the larger islands, where there is more chance for success anyway. The smaller islands do not have beachline enough to furnish the food on which foxes largely subsist when it is available, and consequently the animals have to eat the birds or starve.

I returned to the States wishing that many of our people could see these vast colonies of birds, as well as the seals and sea lions, and realize the wealth of wildlife that the Alaskan seas and islands and coasts support, a living zoological museum that is practically untouched and, under present administrative regulations, will so remain. All of the major bird colonies are protected and have as much patrolling as present circumstances permit. This patrol can be intensified if conditions demand, and additional colonies taken over if the need arises. In the meantime, it is cheering to know that protective measures have been taken in ample time to save some of the most spectacular concentrations of wildlife now existing in North America.

Correction. On page 498 of the November-December issue of *BIRD-LORE*, in Part I of Dr. Gabrielson's article, the sentence: "Of the Cormorants observed—Brandt's, Pelagic, and Red-faced—the Red-faced was found only on Bogoslof Island, in the Aleutians, and on the Pribilof Islands" should read: "Of the Cormorants observed—White-crested, Pelagic, and Red-faced—the Red-faced was found only on Bogoslof Island, in the Aleutians, and on the Pribilof Islands."

With the Mule Deer Through the Seasons

By Gayle Pickwell

Photographs by Ernest Meyers and the Author

In the Beginning

It was early afternoon on that day late in June, and sunlight came slanting through the yellow pines at the margin of Giant Forest in the southern Sierra Nevada Mountains. We had just focused our cameras on the nest of a Mountain Chickadee, when we heard a commotion near-by that sounded like the floundering of a large object. Investigating, we saw a mother doe arise from her fawn just born. The fawn was sprawled out on the ground, bleary eyed, its hair matted with natal wetness.

Within twenty minutes, the dappled infant struggled to its feet, sprawled widely for support. The anxious mother hurried forward to stand watch over her newly born infant; and just a moment later, shaky of legs, the fawn was questing for nourishment.

During their first days the fawns do not follow their mothers, but remain in concealment after being fed, while the doe secures food for herself. We once found such a fawn, perhaps not more than twenty-four hours old, beside a big tree log in Giant Forest. It was in that picturesque and striking concealing pose called the 'freeze.'

The rangers in national parks inform their audiences, in all seriousness, that the fawns have no odor in their earlier ages and hence are in less danger from enemies; that they should not be touched by human hand lest a telltale odor be imparted to them. But a 'freezing' fawn need not be touched

because it does not move, does not move for periods of hours. The one whose photograph is shown here held its pose—seemed not to move even an ear, and kept its eyes widely open, while photograph after photograph was taken—for a period of thirty minutes! This method of protection while the mother is not near is, in most cases, an adequate defense against such natural enemies as bobcat, mountain lion, coyote, Golden Eagle, or black bear. For all of these, motion is the telltale evidence of nearby prey. If that prey not only is motionless but odorless as well, then it is truly protected.

When the fawns are several days old they seem no longer to assume the position of the freeze. Winsome and attractive, they run nimbly and do not allow humans to approach closely, though their parents may express no such fear.

In the central Sierra Nevada, fawns are born about the middle of July. At Giant Forest, though, many mule deer does were giving birth to their fawns in late June and early July. For two weeks or less the fawns spend much of their time in the position of the freeze, rising to meet their mothers only when they return from browsing and grazing, then resuming the immobility of their protective position. Later they begin to run with their mothers and may be seen with them as the does graze on mountain meadows.

The fawns may not attempt to do much grazing or browsing for them-



WHILE THE DOE GRAZES, she leaves her young fawn in a place of concealment where it remains motionless in the picturesque and striking position called the 'freeze.'

selves until September, or until they are two to two and one-half months old, as Joseph Dixon has shown in his monograph.* At this time, as they acquire their new winter pelage and lose their spots, their mothers wean them by objecting when they attempt to nurse; and so the fawns are forced to secure a new source of food—leaves of shrubs or meadow grasses. Mr. Dixon notes that after the fawns are weaned they again associate intimately with their mothers and may continue so for eight months to a full year or more.

During the first snows, a critical period in the life of a deer, the mothers continue to guard even more closely than at other times, even though they are approaching the mating season which, in the Sierra Nevada, occurs from the middle of November to the middle of January.

The First Winter

The mule deer of Giant Forest in Sequoia National Park, at an elevation of 6500 to 7000 feet, find their chief source of food in the lush green grass

*Dixon, Joseph S. 'A Study of the Life History and Food Habits of the Mule Deer of California.' *California Fish and Game*, July and October, 1934, pp. 181-282, 315-354.

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throughout the summer in the high mountain meadows. Winter, however, brings a serious problem, the problem of snow and accompanying increased danger from enemies.

The snows that fall in great blankets in the high mountains soon develop a crust over which coyotes can run and through which the sharp hoofs of the deer break. The coyotes then form teams to stalk young deer; and so with the coming of the snow the mule deer, young and does and bucks, move down the mountain to regions where snow, if it falls at all, never lies so deep.

Very recently a group of us was in Sequoia National Park on October 26. The first of the snows, which had reached a depth of 2 feet the night before, was still falling during the day; but in Giant Forest 6400 feet above the sea, with deep snow all about, the bucks were still present, and fawns and does were seen all the way down General's Highway to the park entry at an elevation of 1200 feet.

This first short-lived snow did not cause the deer to migrate to lower levels. Giant Forest, visited again on November 23, still had deer at elevations of 6500 to 7000 feet, for there was no snow. Visited the following month, on December 20, there was more than 6 inches of snow and, since rains had fallen, there was a hard crust. All of the deer had departed from these high regions, where a month earlier there had been fawns, does, and bucks.

On New Year's Day, in Yosemite Valley this same year, where enough snow prevailed in the upper portion of the valley, at 4000 feet elevation, to make sledge dogs and sledges a possibility, there were still mule deer. But here the snow was not over four inches in depth, bare areas were present, and many trees were at hand for browsing. Winter-sports tourists were also present in numbers to offer food. In Yosemite

Valley it would have been necessary for these deer to move only a mile or less down the valley to regions where the ground was completely bare.

The movement of mule deer from regions of persistent deep snow, it seems, is caused not by lack of food, because there are many trees that still supply plentiful browse, but rather because deep snow makes easier their stalking by enemies. This stalking by enemies would apply most trenchantly to fawns in their first winter; so down the mountain slopes they go and change their bedding quarters from thickets of willow or copses of fir and pines to beds on the leaves beneath the golden oak. Though Mr. Dixon states that in some cases the winter quarters may be fifty miles from the summer range, the Sequoia deer need travel only a few miles to move from the summer range to the winter range, so precipitous are the mountains there. The absence of the deer from their summer range will be of longer duration than their stay, for in Sequoia and in most montane areas, the snows do not melt and make possible the lush meadows until June; and the snows may have prevailed for the six months preceding. The deer will have followed the retreat of the snow up the mountain sides.

During this first winter the fawn, though it long before lost its spots, and has grown rapidly, remains near its mother; but when the following spring has come and it has returned to the summer home, it will have developed, if it be a male, the first spike of its new antlers.

From Spike to Four-Point

The spike of the young deer, like all of the subsequent antlers, is grown with a furry velvet covering. This velvet covering produces within it an antler of bone. The deer's antler at the end of its first year may be as large as $\frac{1}{2}$ to 3

WITH THE MULE DEER THROUGH THE SEASONS



AT MATURITY THE MULE DEER BUCK IS A MAGNIFICENT ANIMAL. It shows massive, widespread antlers with four tines on each, plus the 'eye-guard' at the base.



THESE FAWNS LOST THEIR SPOTS IN SEPTEMBER. This photograph, taken in November, indicates how rapidly the mule deer grows.

inches in length; and it is sensitive, so sensitive that the young deer dresses it on his own legs and not on such hard objects as the trunks of trees. Furthermore, in a friendly deer, even the human hand is resented and the animal withdraws should its velvet-covered spike be touched.

By early September, with the mule deer of the western high mountains, the velvet begins to peel away from the bony spike which it covered, and for a time the spiked deer 'horns' the trunks of trees to clear away the now dead and offending velvet.

The deer is not yet grown—in fact it may even yet associate with the does;

but when its second February comes, its spike is lost and for several weeks the male deer is without antlers, not even a spike antler.

But velvet begins to grow over a new set of antlers by March, and by late April they may be from $\frac{1}{2}$ to 3 inches long and continue to grow until August when they have reached full size under their velvet sheaths. The antler will usually now have two points, although occasionally a two-pointed condition may occur during the first year, and the second year may show three points. At this time the mule deer may have left the companionship of its mother; but it is not yet mature and does not yet

WITH THE MULE DEER THROUGH THE SEASONS

presume to fight with the older stags of hill and forest.

Again in February the antlers will be lost, and in March new ones will begin to grow under a coat of velvet. Thus the deer will reach its third birthday with three points for each antler and begin to have the appearance, if not of a fully developed buck, of one that is fast approaching that condition. With the development of the third point, the buck also produces a short spine called the brow tine or 'eye guard.' The three-point buck goes through the velvet shedding, but the following winter, perhaps with eyes directed toward the does, he must give ground to the bigger

and more mature bucks which confront him.

The following spring, after once again shedding antlers and developing new ones under velvet, he will have four points; and when the next fall comes, he will take his rightful place among the mature and vigorous bucks of the range.

When late November and December now come, the four-pointer will seek out his mates and fight for the right to claim them, though after the breeding season and after the loss of antlers, the bucks will associate together on the friendliest of terms. According to Mr. Dixon, the bucks are in the prime of

THIS DOE WAS FOUND BEDDED AT THE BASE OF A BIG TREE. Its winter bedding quarters are golden oak leaves farther down the mountain slope.



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life from the fourth to eighth years, and during this period they possess four points to each antler. After that, even though they may continue to live, they may lose some of their points and finally be returned to the spikes with which they started in their succession of antlers.

The correct number of points for the mature deer rarely is more than four, the brow tine not included. It is incorrect to count the points on each antler and so add them to the total of eight. Sometimes, although rarely, the condition of multitudinous points does occur in exceptional individuals.

In the West, the different varieties of deer present different dates of fawning,

of velvet shedding, and of antler loss. This is true not only of the different varieties, but also of the California mule deer in different localities and different elevations. This is so significant that the hunting season which follows closely on the shedding of the velvet prior to the season of rut or mating, varies greatly through the state. The state game laws in connection with the hunting of deer are so different for the various regions that the Fish and Game Commission issues a map to tell when the deer may be killed—in August, for instance, in the low mountains near the coast, but not until October in the higher regions of the Sierra Nevada.

WITH THE APPROACH OF THE BREEDING SEASON, the four-point buck seeks out his mates and fights the older stags for his right to claim them.



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The Nature of Things

By

DONALD CULROSS PEATTIE



HERE in the mild winter, with the rain falling on exotic garden vegetation, with my fire of chaparral and live oak sweetly smouldering, and Audubon's Warblers flitting on the trunks of the Monterey pines, there comes back to me, about once a week, the splendor of the Northwest. And I long for it so achingly that I can scarce endure not to start out again, though I know that it is deep now in snow. No bluebells now; no twin-flower; no skimming Swallows; or White-crowned Sparrows singing at 10 p.m. to the last of the sweet long midsummer twilight, with *Gegenschein* on the high snows, and lake water champing at its cobbles. All is locked in ice, the great down-bending coniferous boughs rattling with it. The high passes where I picked moss campion and eight-petaled dryas are blocked with drifts and avalanches, and the long rains will be lashing in from the Pacific, through the spruce and fir stands along the northern coast.

But it all comes back to me as soon as I close my eyes—the sparkling thing that is a northern summer, the turquoise lakes among the mountains, the ice-carved peaks, the chanting forests, and the surge of hastening streams.

If you say "Wyoming" to me, my first ornithological association is, instantly, Swallows and Bluebirds, Violet-green Swallows, brilliant as Hummingbirds, giddy as Swifts, zooming, gliding, power-diving and banking; the West is the kingdom of Swal-

lows, for they have all our eastern kinds there, and more. And the Mountain Bluebirds! You'll never forget your first sight of them; they are paler blue than the Eastern Bluebirds, quite without the soft rusty vest. I remember a pair of them nesting or, rather, feeding their nestlings, up under the eaves of a church whose altar window exactly framed a panorama of the Grand Tetons glittering with snow caps.

But spring the word "Idaho" on me, and I think of Clark's Nutcrackers and of Lewis's Woodpeckers.

The Clark's Nutcracker does his nut-cracking wherever the western white pine grows. Only a little larger than a Piñon Jay, it appears much larger, because a white or gray bird always presents that illusion. Nutcrackers, indeed, have almost the look of Gulls, if you can imagine a Gull on a mountain pine vigorously attacking the cones, and uttering a Crow-like or Parrotish rasp.

I'd seen Nutcrackers before, in the Sierra, but Idaho showed me my first Lewis's Woodpeckers. I didn't need to consult my books to verify the identification. A Woodpecker black as a Crow on head and back with Crow-like metallic highlights, a beautiful carmine band across the face, and carmine belly below the ashy breast and white collar, is not likely to be mistaken if you ever saw a colored illustration of it.

In contrast with the Nutcracker, the Lewis's Woodpeckers uttered not one

syllable, either when approached or disturbed or in flying off. When they flew they seemed especially like Crows, with their long wings, their short tail, and instead of the typical undulant Woodpecker flight, there was a steady powerful flapping.

Lewis's Woodpeckers are found in general at a lower life zone than Clark's Nutcrackers. They prefer yellow pine, which grows in the Transition Zone, and, again like Crows, they seem always to be associated with dead, naked, or burned or blasted trees, rather than with a close intact forest. Fallen grandeur seems to suit them. The grandest of western pines suits them.

Well, the sugar pine is really larger, but it is a strictly coastal tree. Western yellow pines, which remind one much of the long-leaf pine or Georgia yellow pine (same great plates of ruddy yellow bark, like laminated leather, same dazzle of sunlight in the ends of each great tassel), are found in every western state, and in Mexico and Canada—which gives them the widest range of all American pines. Ponderosa pine (for an alternative name) is the pine that stands up to everything in the way of drought, cold, heat, sun, wind, and alkali. It's the friend of the rancher and the prospector. No other is more vigorous or fertile in its self-reproduction.

The first white men who ever gazed upon this pine were Lewis and Clark. And before ever they saw it, while they were still far out on the treeless plains, they discovered its great cones rolling down the muddy Missouri. The sight must have struck them as driftwood looked to Columbus on his first voyage. The tree itself was not long in coming into sight, in what is now central Montana, May 11, 1805, and it is mentioned repeatedly by the travelers, who were, however, ham-

pered in describing it because they kept comparing it to the pitch pine of Virginia.

It was on the Lemhi River, over the Continental Divide, on August 22 of that year, that Captain Clark "observed a species of woodpecker [*sic!*] the beak and tail of which are white, the wings black, and every other part of the body of a dark brown; its size was [greater than] that of the robin, and it fed on the seeds of the pine." Thus inaccurately did the red-headed, sociable explorer describe the garrulous *gray* (not brown) Nutcracker that bears his name.

Not until the return trip, when the party was approaching the Bitterroots, on June 12, 1806, is there any mention of the true Woodpecker, the silent bird named for the taciturn and immortal Lewis.

* * *

A complaint of me has been lodged by a friend with our Executive Director. I accept the challenge on behalf of myself and fellow friends of the wilderness, and while waiting for my honorable opponent to meet me at Bladensburg, I shall proceed to whistle my rapier around in the air a few times.

The charge that I am hurting the cause of true conservation by my fanatic attachment to the lunatic fringe raises the old question of what is the *True Faith*? And reminds me of what the Ettrick Shepherd said of Robert Burns' poems: "They're unco' sweet," he grumbled. "And I know that's so, because they're sweeter than mine, and mine are just sweet enough." Well, it seems I go too far in my conservation fancies, because I go farther than my friend, who is, he tells us, the sincerest of conservationists at heart.

Let us grant that he may well be that. But he has made a more specific and serious charge when he says that my obsession with the preservation of

THE NATURE OF THINGS

wilderness areas is impairing my usefulness as an editor of this magazine. Now Mr. Baker and Dr. Murphy have previously explained, in print and by letter, that I enjoy here the immunity accorded to court fools and columnists generally, which means that I am to be allowed to express my own views, without involving the National Audubon Society, or this publication, in responsibility for them.

But it is just possible that my views and the avowed intention of the National Audubon Society might be coincident. Let us see. Turning to the inside cover of this magazine I find that it is "devoted to the protection and preservation of our native wildlife."

If the preservation of wilderness areas in any way results in the better "protection and preservation of our native wildlife," then the National Audubon Society is in favor of the preservation of wilderness areas. I do not think anyone, even the enemies of wilderness areas, will deny that wilderness areas protect birds and mammals, or that they offer valuable opportunities for the study of them.

When I replied to my correspondent along these lines he shifted his ground. He drew a distinction between "preservation" and "conservation." He believes there is no reason, except an esthetic one, for making such extraordinary efforts to save birds like Limpkins and Great White Herons, California Condors, and Roseate Spoonbills. And esthetic consideration must give way, he reminds us, before human and economic necessities.

I don't deny that they would have to, if what little wilderness is left were really impoverishing our country by its continued existence. But which industry having any relation to wildlife resources is suffering from over-

consumption and *under-production*? Are purchasers clamoring wildly to buy at any price wares that cannot be supplied because they are all locked up in publicly-held wilderness lands? Yet the existence of wilderness areas seems to be a thorn in the flesh of many. The government ought not, we hear, to be holding out on private initiative. In short, if one man wants the land, one hundred and thirty-one million people have no right to it.

Let's examine this claim that there is no reason except the esthetic one for the preservation of wildlife, and that preservation is a sentimental consideration standing quite apart from conservation of resources for practical use.

When we wanted to restore the beaver to its old haunts, both for its value as an erosion controller and as a fur-bearing mammal, we had to go to wilderness areas to find him. Our best chance of propagating and increasing a long list of highly economic species is the preservation of wilderness areas. Preservation seems to me to be very intimately linked with conservation. And no purely utilitarian conservation can be trusted to foresee the needs of tomorrow.

The chief biological and economic reason for preserving wilderness areas is that they do preserve the balance of nature; that they are the refuge of the predators, who are constant in their value to us; that they are great reservoirs of the serene order of nature, where things work the way they ought to. They are the right answers in the back of the book, from which we can get help in solving our problems outside them, when we make a mess of things, as we usually do. The saddest mess I ever beheld in my life was the ruination of privately held forest lands in western Montana. In green and gleaming

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contrast with them stood the neighboring areas held by Forest Service and National Parks.

* * *

It is generally admitted that there is something missing in American life, which was once present. We have everything we need to do with, and we don't know what it is we want to do. Once we had to fight bears and 'painters,' and even the Injuns. Once the very trees were our enemies. Now we have to fight our doubts; we are overwhelmed by our wealth and all tangled up in our conveniences. In pioneer times we walked—I mean *they* walked—a mile, five miles, to school, snow or rain. Now Mother delivers them in a heated car to the school door, and the walking consists in getting from the curb to the desk.

In short, once we were struggling with a natural environment, and the struggle brought out the traits that we call typically American—confidence, resourcefulness, wiry health, cheerfulness in adversity, stoicism in pain, hopefulness when others despair, neighborliness, tolerance, planning and planting for the future, inventiveness, hospitality, abhorrence of class and race distinction, the measurement of a man by his character and accomplishments. Today we are struggling with a man-made environment. It isn't yet by any means certain that it will call forth from us all these qualities. There is much evidence that it results in nerve fag, muscular atrophy, the need of stimulants and sedatives, self-doubt, cynicism, and thrill-seeking. Imagine a pioneer manufacturing a danger! Or wondering if life were worth living. Once life was sweet, and death was cheap. Let us hope we do not hold the reverse today.

There is an answer, a partial answer, for some of these ills. I saw it last

summer all through the great Northwest country—parties of young men, of women and men together, of girls alone, off with their packs and tents, their cameras and fishing poles, binoculars and swim suits, for the wilderness. You saw them starting out from the gates of Grand Teton National Park, heading into Glacier National, for Kintla and other lakes where no auto road runs. Two boys with a canoe on their shoulders, in Idaho. Two girls on horses in Oregon, with packs behind the saddles. A flock of fair-haired children, with nothing more on than was indispensable, trooping up beside a white torrent in the Sierra, threading their way confidently through the woods, plucking berries as they passed along.

Every one of them was hunting wilderness—a patch of it. Some had come three thousand miles to find it, because none is left them nearer home. Strong, experienced young men can use hundreds of square miles of it, children require only a little. It isn't the old wilderness, which was vast and often terrible, which, if it built men up, also wore them down, which shut them in, deprived them of doctors, education, a normal quota of society. No hostile Indians now; no bears to be seriously afraid of; no starvation, thirst. But still a wilderness, a place where you can pit your resource and wit and strength against a great but a smiling force, like a swimmer wrestling with sunny combers. I say this wilderness is worth preserving. That there are riches in it—riches in ourselves, rather, which only wilderness can bring out. I say we need it, and our children are going to need it more. And that the same land, if it were turned into corn-patches or even into great and prosperous cities, would not be worth to the nation what it is worth as it is.

Marsh Hawks: Their Trials and Tribulations

By Lewis and Marian Walker

SPRING opened rather auspiciously for us where Marsh Hawks were concerned. High above a distant hillside we caught sight of occasional flashes of white, dropping lower each time. Soon a battleship-gray male Marsh Hawk came into identification range, continuing his courtship flight all the while. It consisted of zooming dives and wing-overs as though to let the sun glint on pearly white underfeathers. Repeat performances, or encores, were delivered tirelessly as he gloried in being alive. For a full twenty minutes we were the audience as he spread his aerial maneuvers over the length and breadth of the Torrey Pines (California) slough. At one spot his courtship became feverish in its tempo, and then we discovered his mate.

On our first view of her brown form, she was carrying a beakful of dried marsh grasses to a distant boggy area. During her nest building, she seemed unexcited by her mate's display and made trip after trip for more material. This was the middle of March.

A week later we again visited the slough, equipped with hip boots, cameras and a framework on which to build a photographic blind or hide. Both adults were seen on fence posts as we waded through the reeds to the probable nest location. The nest itself, soon found, was empty. Fresh boot tracks and a wad of cotton told the story. Somewhere, some collector is gloating over some hollow blue egg shells. We wonder if he likes them as much as the parents did?

In almost every case a bird will lay a second set of eggs if the first is collected and there was probably no harm done. This pair of Marsh Hawks proved to be no exception to the rule. Within two weeks, courtship flights were again in order and the pair selected a spot for a second home-site. Soon the female disappeared from view for long periods as she commenced incubation.

Again we packed cameras, boots, and blind paraphernalia and headed for the slough. Half a mile from the nest both birds were seen busily carrying sticks and dropping into a maze of cattails. Something was wrong. Investigation disclosed a single egg laid on some wind-blown cattails around which the birds were trying to build. Just what the fate of the second nest was we never learned, but the single waif egg became buried in debris and cracked.

Came the middle of April. One month had passed, during which time three nests had been under construction and two sets of eggs laid. The pair of Torrey Pine Marsh Hawks flew about aimlessly, when they should have been feeding young.

Ten miles up the coast we found another nest. This one had been overlooked by collectors. It contained four hatching eggs and one downy hawklet. At our approach the adults started their raucous, cackling alarm call, making repeated dives in our direction all during the building of the blind.

Over a period of weeks, it seemed that the birds could count, although their I.Q. was not very high. If only one

FIGHTING MAD

But the young Marsh Hawk's aggressiveness is of little consequence when the fearless parents are in the vicinity diving repeatedly at the photographer.

Photos by Lewis and Marian Walker





COMING HOME WITH A GROUND SQUIRREL.

Money is spent for shells to shoot at the rodent-eating Marsh Hawk. With the Hawks gone, rodents increase; hard-earned money is then spent for poison.



Photo by Lewis and Marian Walker

LANDING ON ITS FAVORITE FENCE POST. From such a perch, the Marsh Hawk quarters low over the meadows with buoyant unburried flight in its systematic search for prey.

person went to the blind and crawled inside, the birds would remain nervous for several hours. If two people walked to the blind and one walked away, they were partially fooled, and their return to the nest would be a matter of thirty minutes or so. Three people hoodwinked them entirely. When two of the party walked away the third one in the blind always reported quick results. The birds seemed to drop in immediately to see if that crowd of humans had harmed their young.

Each day gave forth some different photographic record. The male seemed to be the hunter of the pair, while the female was in complete charge of the home. She would leave the nest at his

call and towering high in the air would retrieve prey, which he dropped, before it touched the ground. The male would often swoop low over the nest but never came into camera range.

Peculiar things can happen in a blind, especially if that blind be near a road. At one time a movie camera was whirring away getting some fine 'shots' of the female dismembering a ground squirrel and feeding the young, piece by piece. Suddenly a car door slammed. A moment later there was a shot. The occupant of the blind burst out, 'seeing red.' Stalking across the swamp was a Federal officer (not fish and game) with a pistol still in his hand. Apologies were profuse. He gave "target prac-

MARSH HAWKS: THEIR TRIALS AND TRIBULATIONS

tice" as his reason and then added rather lamely, "You can't hit one of those birds with a pistol." The pair of birds and the photographer were irritated the rest of the day.

Half a mile from the nest there lives a rancher. On fence posts about his property there are signs, 'Beware Gopher and Ground Squirrel Poison Out.' We heard rumors that he was a confirmed Hawk hater. One morning the male came in with feathers shot out of one wing and was so wild and nervous that a close approach could not be made.

Let's not look at this in a sentimental light but purely from an economic standpoint. Marsh Hawks are protected in California because it has been determined by just such studies as the one herein recounted that they are beneficial. During our observations the pair delivered to their young well over a dozen ground squirrels, one rat, and one small mouse. Dried in the nest when we found it were the remains of several rabbits, also considered pests in California.

Hard-earned money is spent for shells to shoot at Hawks, Hawks which live mainly on ground squirrels. With the Hawks gone, the rodents increase. Hard-

earned money is then spent for poison. It just doesn't make sense to us.

Early in May the young had reached that age where wobbly legs no longer made them stay in the nest. They started to roam over a twenty-foot radius. The female no longer delivered food to them but, instead, would alight and call and let them come to her. Observations became increasingly difficult and photographs were out of the question so we bid them adios.

In passing by Torrey Pine slough, where we originally planned our Hawk observations, we noticed a handkerchief fluttering on a cattail. The female Marsh Hawk was seen dropping into the reeds near-by as though nesting once again. Walking quietly toward the spot, we found a nest with two eggs, almost under the handkerchief marker. Was this nest marked just for curiosity or was it marked to rob when the third set of eggs was complete? We did not know then nor do we now, but we feel fairly positive that these eggs are due to hatch. A Marsh Hawk will not read and heed an India ink inscription on its eggs saying 'Do Not Touch—Third Set,' but such a set would not look well in a collector's cabinet.

THE NEST CONTAINED FOUR HATCHING EGGS AND ONE DOWNY HAWKLET.
At our approach, the adult Marsh Hawks started their raucous, cackling alarm call.

Photo by Lewis and Marian Walker



White Wings Over Florida

By John H. Storer

MANY are the beautiful and spectacular sights of wild birds cherished by those who have participated in the Florida tours conducted by the National Audubon Society during February and March. None could have been more beautiful than the American Egret hunting along the bank of a marsh or gliding to a landing with downcurved white wings against a glowing blue sky.

Perhaps some of the more patient observers were privileged to see a group of Snowy Egrets playing together, yapping at each other like a litter of half-grown puppies. In April this might have been against a background of water hyacinths, great sheets of lavender flowers. But where were those beautiful plumes that once made bird history, plumes so beautiful that they could be sold for thirty-two dollars an ounce in pre-New Deal money? Do they always lie almost invisible along the bird's back?

The Egret is very proud and careful of its plumes, and does not raise them for display without good reason. But pay it a visit incognito in its home.

It is a brilliant Florida morning, the air fragrant with the scent of sweet bay and wild grape. All seems quiet among the trees that cover the little submerged island. Noiselessly we wade through the brown water, working our way among the tangle of bushes and smilax thorns to the carefully prepared blind.

Forty feet in front of us, through an opening in the trees there are some dead limbs buried under a blanket of vines,

and here, in a rather unsubstantial bower, an American Egret stands over her nest. Her neck is drawn back in graceful curves, and the smooth outline of her back is softened by the exquisite film of plumes that rests above it, glistening in the sunlight.

Lazily she drops her head, raises a long black leg, and slowly scratches her neck. The neck twists into a replica of the Gordian knot, as she rubs her head against her breast. She looks over her feathers, carefully cleaning and adjusting them. She raises one long wing and here and there smooths a feather into place. She shakes out her plumes, like the lace on a bride's veil, then carefully takes them, one at a time, starting near the base, and passes them through her bill.

Suddenly she looks up and her plumes rise into the air. She draws her neck down and settles back on her heels. Her plumes stand straight up from her body and look almost like a glowing ball of white filmy lace. There is a cry overhead, faintly reminiscent of a honk, but higher pitched and more musical than the honk of any Goose. Her mate drops to a near-by branch. With plumes raised, he walks onto the nest, bowing as he comes. She rises to meet him, bowing in her turn. They face each other across the nest, touching cheeks and rubbing necks together affectionately, while the three youngsters reach up with open mouths, eager for a meal. Another bow or two is all that the impatient young will tolerate, whereupon the female steps aside, shakes her plumes down



Photo by Allan D. Cruickshank

EXQUISITE PLUMES GLISTEN IN THE SUNLIGHT. *Ordinarily lying almost invisible along its back, the Snowy Egret will not display its plumes without good reason.*

into position, and flies off to forage while the male turns to the business of feeding the children.

As he regurgitates the food from his crop—frogs, insects, minnows—there is violent competition for it. One baby grabs his bill crosswise, another reaches up for a grip farther back, while the third engulfs his face, covering both eyes. They sway for a few seconds, then the grips relax as a frog rises in the old bird's throat and falls to the nest. The babies scramble for it while their parent lowers his head to prepare for the next onslaught. Appetites are at last satisfied, and he takes his turn at arranging dress and smoothing out plumes.

There are other nests in the bushes around us. To our left we can hear cries of greeting as an Egret comes in to feed its family twenty feet away. Just within our narrow line of vision, another Egret stands up to turn its eggs. There is the occasional flash of a wing or plumes as others drop to their homes among the near-by branches.

We try to distinguish the notes that come to us—the harsh squawk of a Ward's Heron, the sharper cry of Louisiana and Little Blue, the yaps and gurgles of the Snowy Egret. Two Snowies fly into our opening, playing together among the low branches over the water.

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In the crotch of a bush just under our American Egret family, a Little Blue Heron sits on its nest, rising occasionally to turn its eggs and adjust its feathers; its mate slips up and takes its turn on the eggs. Six feet to one side, a Snowy Egret is working over the twigs on the edge of her nest, fitting them into place. Her mate moves up a near-by branch to pass her a twig which she fits into place with the others. She steps to a perch over the nest, her exquisite headdress of plumes standing erect, and the tracery of plumes rising along her back. For a second she surveys her work, then steps down and snuggles into the nest to test its fit.

Two years ago, much of this breeding area was almost entirely deserted. Drainage, followed by drought and fire, had made the rearing of young Herons impossible in large sections of Florida, and the crop of young birds was very much reduced. Acquaintance with nesting conditions for the past three seasons has brought home with great force the devastation caused primarily by the drainage of so much of the state. It has emphasized the hazard that drainage and 'development' oppose to the future of these birds. It has also brought some knowledge of the quiet but effective work being done by the National Audubon Society to restore and protect areas vital to the existence of these and other beautiful birds and, would that it could be impressed on every bird lover, it has given convincing proof of the need for expansion of the Audubon work, which can come only through greater support for it from every one of us.

It is difficult to leave the blind from which we have been privileged to watch the Egret's home life, but there is a trip to another area under protection by the National Audubon Society that will

leave three more days marked up in red letters in the life of any bird lover.

On a beautiful April morning we drive with the Audubon warden down the Tamiami Trail, to the sun-drenched town of Everglades. Some Florida tourists will tell you that the state is flat and uninteresting. Indeed, along many Florida highways where the hand of man has 'developed' the land with drainage, fire and axe, this criticism may hold true, but along this stretch of the Tamiami Trail we may find unspoiled Florida scenery. Great hammocks of deep green palms rise from the high waving grass of the glades and spread their fronds against the background of exquisite light green in the great cypress swamp beyond. In the hammocks near the road, long gray fingers of air plants hang graceful silhouettes from the tree trunks, their brilliant red and blue blossoms rising skyward among them. The sky to the southward reflects the luminous glow from the milky waters of the Gulf of Mexico.

If we are lucky, we may see one of the most beautiful of all birds—the Swallow-tailed Kite. Like a great black and white Barn Swallow, with over a four-foot wingspread, it patrols back and forth along the lines of tall pines with a swift unhurried flight on almost motionless wings. It seems to be at home in almost any position in the air. Its body may point skyward, earthward, or forward; in a sharp bank it may appear almost to stand sideways on one wingtip, the beautiful tail seeming to act like a third wing. It opens or closes to meet the varying currents of air; one prong may rise for a second and then the whole tail tip sideways, giving the appearance of a great blue-black cross in the air as the bird sails toward us. With a graceful sideslip and almost no change of speed, it drops to pick up some unlucky dragonfly. Against a gust of wind it



Photo by Allan D. Cruickshank

WOOD IBISES DRIFTED IN BY TENS, TWENTIES, HUNDREDS. As dusk approached, the milling hosts of wings began to turn the trees and bushes white.



Photo by Allan D. Cruickshank

AN AMERICAN EGRET POSES ABOVE HER NEST. She drops her head and slowly raises a long black leg to scratch her neck.

sweeps perpendicularly upward, gliding forward and back in great loops or figure-eights, then high in the distance it will close its wings and drop perpendicularly like a bullet for a thousand feet or more, and you can hear its bill snap as it picks up its prey at the bottom of the dive.

Two irate Blackbirds rise from their hidden nest to attack the stranger. Scolding furiously, one of them darts at it from a few feet overhead. With a nonchalant sideslip, completely unhurried, the Kite lets the surprised Blackbird shoot past. It glides to the ground with a long sweep. One foot reaches down-

ward just touching the grass, then without checking speed it rises with a fat beetle; as it coasts forward on motionless wings, it bends its head and brings up its foot to enjoy the tender morsel.

With a few easy wing-sweeps it sails from sight over the mangrove swamp, and we turn our attention to the patrol boat at the dock. We zigzag out among the Ten Thousand Islands, low mud banks covered with the dark green growth of black mangroves which rise from a tangle of gnarled, curving roots. The sky—a light glowing blue extending to the very horizon—seems to rise without curve from the milky green

WHITE WINGS OVER FLORIDA

water, like a perpendicular wall reaching back into infinity.

We go out past Duck Rock and Buzzard Key where a few weeks later the Herons and Ibises will gather in tens of thousands to roost at night, after the breeding season. Up a little grass-bordered inlet, the boat is slowed down to a mere drift and twenty or more Roseate Spoonbills leap into the air. The sun glows through their vivid pink wings, giving marvelous contrast to the light blue sky, as the birds circle to look over the intruders, and our memory can treasure one more never-to-be-forgotten sight.

Forty-five miles from Everglades we turn into the mouth of the Harney River, where great red mangrove forests rise from a sea of twisted roots that would give any long-distance hiker material for a first-class nightmare.

A Swallow-tailed Kite drifts overhead and another crosses the river ahead of us. We stop the boat to watch the aerial display. In the high distance a speck grows into a third Kite, and soon there are seven of them in the air together—sailing, diving at tremendous speeds, looping, sometimes gliding in so close to the boat that it seems here is one creature that has no fear even of man. Perhaps this explains why such an exquisite and once-common artist of the air has become so rare.

Farther on, we stop to watch the nest of a Short-tailed Hawk. It rests in the crotch of a red mangrove thirty feet above the ground. From the nest hangs a two-foot streamer of Spanish moss, which is the trade-mark a Short-tailed Hawk likes to put on its nest. No Spanish moss grows within many miles of this nest but the birds evidently considered it worth the long carry.

We continue up the river to its junction with the Shark, and up the Shark to Little Banana Grove, twenty miles from the Gulf. Here we find the good

ship *Audubon* on which the warden lives during the nesting season at the great Shark River rookery. In a skiff we set out up the river to the rookery. Bushes along the bank are weighed down by vines of wild grape full of sweet-scented bloom, and among the vines we see the beautiful shiny leaves of the rubber tree. As we move quietly over the brown water, the surface breaks here and there with a swirl as some great fish darts after its prey. Suddenly the dark back of a six-foot tarpon rises directly ahead of us and disappears again trailing a long wake behind it.

The sky turns glowing red as the sun nears the horizon and long lines of White Ibises begin to fly overhead. Some turn off and drop among the bushes of the rookery, but most of them continue northward to some other destination, the long lines of wings making striking black silhouettes against the sunset. Groups of Egrets and Wood Ibises drift in—tens, twenties, hundreds—and the bushes begin to turn white in the gathering dusk. The milling thousands of wings over the bushes remind one of bees swarming over a hive in the springtime. The surface of the river reflects the sky's red glow. Beautiful four-inch cups of moonlight morning glories dot the vine-covered branches as we glide back to the *Audubon* for the night.

We wake in the morning to the grunting of alligators along the river bank. Four of them call back and forth to each other while we eat breakfast by the light of a vari-colored sunrise, a group of Coots splashing and chasing each other over the water near-by.

The warden has been wondering about those Ibises that flew north past the rookery last night and he discusses their possible destination, as he has been studying and trying to follow their flight lines for several days. We go up the river in the skiff, up to its very head

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where it divides into little branches. The banks narrow down till there is barely room for the skiff to pass. We push under overhanging mangrove roots and finally come out into the open glades where the stream ends. Standing on tufts of grass we search the sky without finding a sign of life. Suddenly the warden exclaims and points to the horizon. "There they are, hundreds of them." But to our incredulous city-dimmed eyes there is nothing but blue sky. Finally, with the aid of 8-power glasses, we too can see the long lines of birds, which seem to be flying toward the head of Broad River. Satisfied, we turn back to the boat. On a later visit to Broad River, a great colony of White Ibises was discovered nesting there.

We were later able to make another visit to the rookery. Along the banks are groups of Wood Ibises at the work of nest building. Wings flap as one steadies itself to wrestle with a branch which it is trying to break off for its nest. Another flies in with a stick and, with the help of its mate, works it into place with ungainly bill. This scene is repeated among the low bushes all up and down the bank.

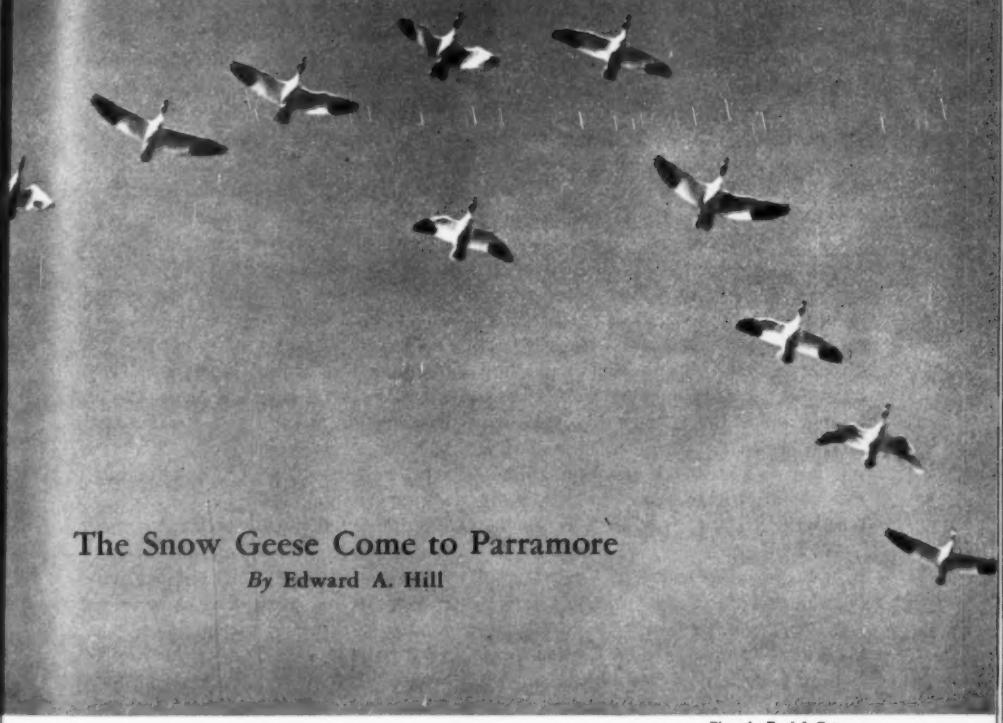
Overhead groups of White Pelicans soar on motionless black-tipped wings. Their eight-and-one-half-foot wing-spread gives them the appearance of airplanes moving in great circles up toward the sun. Long lines of White Ibises hurry over the mangroves. The leader may strike a current of rising air and rise with it. Each bird in the line rises in its turn as it reaches the spot. At the far side of the rising current each bird drops again, always holding its place in the undulating line, giving the impression of a line of skaters cracking the whip. Sometimes a Wood Ibis will fly overhead, up two thousand feet or more; over the rookery it will close its wings and shoot earthward head first, like a giant closed umbrella, whirling in the

air as it comes. The wind roars through its feathers with the sound of a falling airplane.

The sun is low in the west again and the long lines of White Ibises start homeward, but tonight apparently more of them have decided that the Shark River is the place for them to settle. As the line passes the rookery, groups of birds turn off and drop to roost, while the leader with his faithful remnant keeps on toward Broad River. Nearly every line breaks in this way at the rookery. What instinct or attraction can have brought about this change since last night? We watch, fascinated, as the long lines stream past the glowing sunset and the milling hosts of wings again turn the dark bushes white. Again we glide back through the enchanted vine-covered banks, heavy with wild grape perfume and morning-glories.

We are sixty-five miles from the nearest town, but several times through the day, small yachts or fishing boats with sportsmen after tarpon have come up the river. Everyone has been hailed and the pilot has been politely told about the rookery and the danger of driving the birds off if they are disturbed while nest building. In every case, after a friendly discussion, the pilot has agreed to stay safely away from the nesting area.

Like all Audubon protection work, guarding of this rookery is based on the good will and coöperation of the public and of the fishing guides who visit the area. To one who has in years past seen White Ibises and other birds shot by northern tourists from their automobiles along the roadsides and who has heard the stories of some of the fishing guides about the shooting orgies that have been staged by fishing parties among the Ten Thousand Islands, it is a tremendous satisfaction to see this spirit of coöperation and respect for wildlife being developed by the Audubon wardens.



The Snow Geese Come to Parramore

By Edward A. Hill

Photo by Paul J. Fair

OUT of Ellesmere Land, in the deepening twilight of fall, come the Greater Snow Geese. Leaving their Arctic Circle breeding grounds, they wing southward to the land of men. Like snowflakes out of the North, they fill the sky and drop as swiftly into the glades and marshes of our coastal islands. These havens, lying south of Ocean City, Maryland, are sandy barriers protecting our coast from the lash of the sea, uninhabited except for coast-guard stations and invaded only by breakers and birds.

So it was that late in November my party faced a 'northeaster' at daybreak to search the marshes of Parramore, an

island off the coast of Virginia; for here, until Christmas, the Snow Geese are known to come. Parramore Island is six or eight miles off Wachapreague, and night and morning a flock of five or ten thousand of the great white birds wings its stormswept length, to sleep and feed in the glades.

A first glow of morning red showed faintly back of the dark pines on our right and the cutting wind seemed all at once refreshing and exhilarating, now that beauty had taken possession of the world. All the earth was a silhouette and the breakers gray in the dawn. Beauty was etched in form and line; only the crimson behind the pines

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prophesied the colorful canvas that nature was to paint for us.

Up the beach we went, stepping over the serpent-shaped masses of marine vegetation that had been rolled up on the sand. It reminded us of raked hay in June meadows. But there was no meadow mildness here, only a terrific blowing beauty that drove all thoughts from our minds save that we were in a maelstrom of the elements. Sand, wind, and sea stung our faces, leaned against bushes bending them landward, and surged in patterned foam around our feet.

Then light came to blend them, breaking in the east just over the white-capped rollers that carried in the glory of the sun. It was cupped in their hollows like a golden wine and its diamonds were borne proudly on their crests. Jewels in liquid form melted at our feet and slithered through goldenrod to quiet glades where everything was still.

We walked cautiously, crouching behind bushes time and again as a string of pearls came across the sky. Just wavering gray beads at first, then a willowy winging line and the Snow Geese dipped behind breakers as we moved on. A Buzzard sideslipped in the sun, the early light painting his under-wings a rare hue. The rising tide sent us staggering at times, its foam nearing our boot tops as we struggled for rising ground.

Then, through our glasses, we saw what we had come for—Snow Geese in a glade! Off in the distance, behind a long row of myrtle forming a blind, they rested on the quiet water. Heads under wings, sleeping, like an acre of cockle shells, round and white.

Slowly we advanced, moving our feet carefully so that the water from our boots would drip silently back into the ripples they had made. Conversation was rare and whispered. There was a mounting exhilaration. Even the sun rose above its cortège of clouds; we

checked its light, set our cameras, and halted abreast an opening in the myrtle.

Breathless, we peeped through. Never have I been so excited. Acres of cockle shells, white as snow, floated upon the water. I tripped the shutter and suddenly all was motion. The cockle shells came to life as one. Wings flashed with a whirring vibration we could feel as well as hear. Like great flakes returning to the heavens, the Snow Geese whirled to the sky.

Into the sunlight, against the blue, they whirled in indecision. It was a snowstorm in the sun. They whirred and called with high and low notes.

Leaders took positions, and this symphony of sight and sound diverted into 'V's' that streaked across the eastern sky in motion patterns no words can describe. In and out of the pattern, a single Blue Goose threaded its solitary way.

Film rolled through our cameras, but it can never record the emotion of that morning. It may stop the flight of a few white wings that we may see their black tips dipping in the light, it may show a few eager necks stretched toward the sea. It may even show the clouds of the east dotted in endless distance with specks of white, but pictures can never convey the thrill that was ours. They can never reveal the vastness of the spectacle, how it surrounded us, enveloped us, drummed in our ears, swarmed before our eyes, and then dissolved into infinity in wavering lines of pearl.

As we crossed the glade where the Geese had rested, the sudden stillness forbade conversation and our eyes met with a mutual respect for a place almost sacred. Bits of down floated upon the water as though the shy spirits of a snowy land had dusted it with white. They had left something of themselves to grace the silence . . . feathers, for remembrance.

Bird Migration

By Roger T. Peterson

PART II

CENTRAL PARK, surrounded by Manhattan's skyscrapers, is at times an amazing place for birds. It is said that the 'ramble,' a woodland of several acres near the center of the park, is better known ornithologically than any area its size in the world. Chicago, Boston, and other large cities also have their natural bird traps, but Central Park is the most famous of them all, and the best month is May. Most late spring migrants travel at night, sweeping north by the millions over the breadth of the continent under cover of darkness. When dawn streaks the East with its first light, they drop into the nearest trees and shrubbery. But what of the travelers that are migrating up the coast or crossing New Jersey? What do they do when they find themselves over New York's desert of skyscrapers at daybreak? What a hostile outlook lower Manhattan or Hoboken must present to a small tired bird! Nothing but a great arid waste, a solid mass of stone and steel, cut and crisscrossed with endless canyons and gorges. Aside from an occasional ailanthus or sycamore tree, hardly a growing thing can be seen except in Central Park, which shows dimly in the distance as a patch of green. No wonder the park is a stopping place for so many wayfarers each spring and fall. Well over 200 species have been recorded, the record for one day (up to 1940) being seventy-nine species. Somewhere there must surely have been an eightieth bird that

escaped the scores of searching eyes and binoculars that combed the ramble and the other sections of the park that day. In some places the trees buzzed with birds—a half-dozen Scarlet Tanagers were seen in a single oak and several male Rose-breasted Grosbeaks in another; in one clump of bushes five species of Thrushes were identified. New York bird students still talk about that day.

Migration Routes and Flyways

It has been said that there is not a spot in the country over which migrating birds do not fly, or where many more do not pass over than alight. The presence of birds in a spot is due more to the right places for them to stop and feed than to anything else. Central Park is such a place, but probably just as many birds pass over the built-up parts of the city during the dead of night as cross the park. We look at a woodland where Solitary Vireos can be found in migration and say that it is in the lane of travel of this species, but, on the other hand, Solitary Vireos undoubtedly fly over vast stretches of meadow and farming country where they would not stop because of the inappropriate terrain. One would as soon expect to find a Meadowlark in a pine woods as a Solitary Vireo in a meadow. But aside from this sort of thing, there *are* such things as migratory routes—lanes of travel that are fairly definite and constant; for example,

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most Bobolinks enter and leave the United States by way of Florida, crossing the West Indian chain to and from South America. Offhand, with our knowledge of geography, it would seem to us just as easy for a Bobolink, nesting in eastern Oregon, to take a path west of the Rockies and fly down through Mexico to its wintering grounds in South America, but no, like all its ancestors in the past, it heads diagonally across the continent and leaves through the southeastern corner of the United States.

The word 'flyway' has been conveniently used to indicate the broader bands of migration where, because of certain general land contours, such as mountains, plains, etc., numerous individual migration routes merge. Some ornithologists do not like to use the term 'flyway,' rightfully insisting that there is *no spot* where some birds do not travel. However, as every student of migration knows, it is helpful to speak of the major flyways at least, as it gives a much better picture of the most heavily traveled routes which our birds take. Over the United States, birds use at least six or seven main north and south routes. These great flyways are shown in simplified form on the accompanying map.

An excellent classroom exhibit can be made by putting a large map of North and South America on the wall. Place a colored picture of some local species of bird in the upper right-hand corner. Then indicate the paths between the summer and winter homes of the species by means of colored ribbons. This exhibit can be changed every few days, if thumbtacks are used to fasten the pictures and ribbons. It can be changed each time a new migrant arrives and is reported by the class. Use any good comprehensive bird book for reference, or refer to the small migration maps in 'The Migration of North American

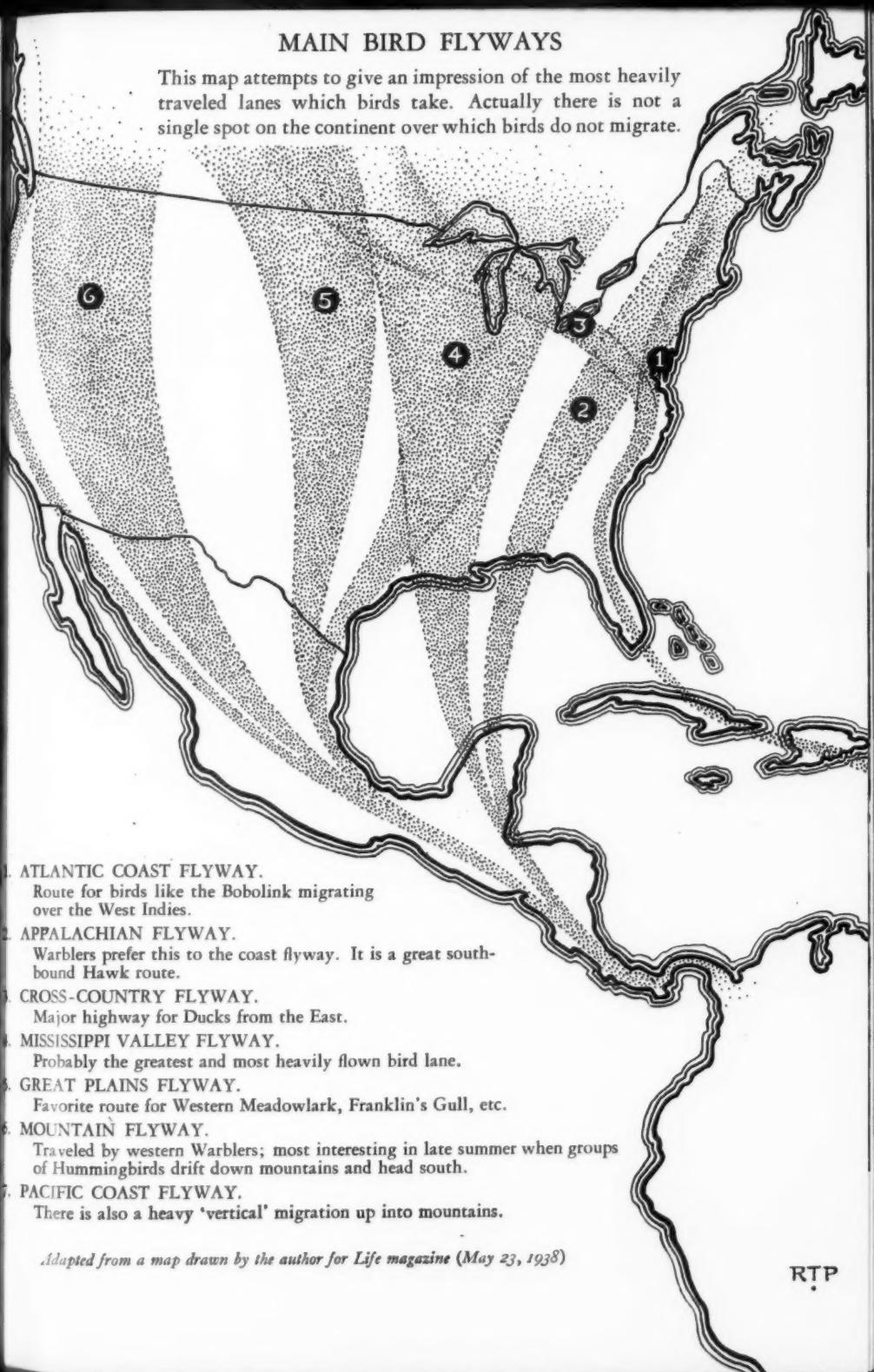
Birds' by Frederick C. Lincoln. Every teacher should send for a copy of this bulletin (Circular 363), which is obtainable through the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents in coin. The same material can be found in more extended form in the book 'The Migration of American Birds' by Frederick C. Lincoln.

Why Do Birds Migrate?

It is very easy to state the benefits of going south when the climate changes. Cold weather, snow and ice mean less food for birds to eat, so it is obviously to their advantage to move out . . . to go into some region where living is easier. These travels make it possible to utilize two different areas, each at a time when food is abundant; it enables birds to occupy the breeding area at a time when there is an unfailing food supply for their young, and avoids the risk of their starving by staying there throughout the year. Of course, there are certain birds that have learned to find their living throughout the year, even in the coldest regions, but most birds are not so adaptable. The advantages, then, of traveling are obvious, but the *advantages* and the *causes* are not the same thing. Birds do not think *why* they migrate; they do not consciously anticipate the rigors of winter, for many of them, like most of the Warblers and the Orioles, have never seen a snowflake nor an icicle. Nor do most species wait until there is a chill in the air, and the food begins to fail. From what little we know about birds' minds, we believe they do not reason these things out; they do not rationalize that it would be a good idea to go south while flying conditions are still good and food still plentiful along the way. That is the way we would think things out, but we are not birds. Some instinctive urge seems to compel them to move.

MAIN BIRD FLYWAYS

This map attempts to give an impression of the most heavily traveled lanes which birds take. Actually there is not a single spot on the continent over which birds do not migrate.



Adapted from a map drawn by the author for Life magazine (May 23, 1938)

RTP



Photo by Paul J. Fair

WEATHER IS A MAJOR INFLUENCE IN BIRD MIGRATION. When starting, birds do not know whether they are going to run into snowstorms, winds or fogs.

The mere use of the word 'instinct' does not explain everything, however. We would naturally like to know *why* the instinct? This might never be definitely answered, as the original causes are probably lost in the remote past. One of the most popular theories is that the changes in climate during the glacial period were responsible for the origin of migration. The extensive ice cap crowded many of the birds into the southern parts of the United States and into the Tropics. When the ice cap began to melt, many birds followed its retreating edge. With each recurrent winter, they were forced back again by the snows. Each spring the birds again followed the melting ice. In this way, conjecture has it, the birds shuttled back and forth for countless years until they developed the instinctive habit of migration. Of course there were no birdmen then to keep notes on this

process, so it is merely a theory, but withal, a reasonable one.

Another idea is more closely tied up with the theory of evolution. In brief, it is contended that the original area occupied by the species was small, and as its kind prospered and multiplied, it became necessary to spread out. The limited area was not enough in which to find nesting places for its increased numbers. They wandered out to the edges, and then after the nesting was over, came back to their original range. This pushing out and returning continued until a lengthy migration route was established.

The *remote* causes might explain how migration developed in the first place. But they are quite distinct from the *immediate* causes that prompt birds to migrate each successive year. What is it that starts them off at a certain time? Why do they stick to a fairly close

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schedule? They seem almost like boats or transport planes that start at a certain place, leave at a certain time, and arrive according to schedule. A boat or a plane must have a pilot to set it in motion. The pilot in a bird is its glands. The glands are the controls that make male birds sing in the spring and females lay eggs. We still do not know very much about how they work. There is a great change in these glands before the nesting season. There is another change in late summer and fall after the nesting is over. It is during these periods, when the glands are changing, that birds migrate.

According to some ornithologists, the force that seems to start these glandular changes is *light*—the increase of light in the spring and the decrease of light in the fall. Light, then, is the signal that tells the pilot when to take off. As the spring days become longer, the sun

climbs higher into the heavens and exerts its changing influence on the glands of the bird. When the right day comes, the bird, not thinking how or why, leaves for its distant goal, to which it is guided as unerringly as a modern plane, with its complicated control board. Like a plane or a boat, winds or weather might take it off its course . . . perhaps hold it up a little, but barring mishaps, it reaches the port for which it started. Once in a while, due to some abnormal circumstance, a bird will wander far from its normal range, but this is accidental. Should a bird start for its breeding ground in Maine, it will not turn up in Salt Lake City instead, except by the purest kind of accident.

It is a constant source of wonder to us how birds find their way. We still do not know exactly what *guides* migration. It is not a matter of experience,

MOST MIGRATION IS WITHIN HALF A MILE OF THE EARTH'S SURFACE.
Aviators rarely find birds at a height of more than a mile above the earth.

Courtesy of American Airlines, Inc.



for most young birds do not follow their parents, but trace the ancestral path all by themselves. Birds might follow visual guides to a certain extent. They sometimes seem to follow coast lines, mountains, ridges and water areas, but at night they cannot always see the contours of the land, and the air path is unknown to them. Much of the journey, at least, is accomplished by 'blind flying.'

Homing

The instinct called 'homing' plays a large part in migration. One of the best definitions of bird homing is "the ability to return to a known goal, over at least a partially unknown flight road."* Every bird has this instinct but some of the non-migratory birds to a lesser extent. Homing is not necessarily the same thing as migration for, according to the above definition, it is a return to a *known* goal, whereas most of the migration of young birds is toward an unknown goal. Perhaps the best article ever written in English on the fascinating subject of homing appeared in the January-February, 1937, issue of *BIRD-LORE*—'The Homing of Birds' by Ernst Mayr. It is well worth reading and can be used as a basis for classroom study. Dr. Mayr, in describing the phenomenon, says "it seems as if the bird were tied to its home with an invisible rubber band and that no matter what you do with it, it will be pulled back."

No one seems to know just what it is in the bird that controls this ability. There have been many explanations but no really satisfactory ones. Some writers have contended that birds remember land-marks, but this is only possible when they are very near home in familiar surroundings. If a bird is taken from New Jersey to Ohio and

*Mayr, Ernst. 'The Homing of Birds.' *BIRD-LORE*, Jan.-Feb., 1937, p. 5.

released, the chances are it will return to New Jersey without much trouble even though it had never been to Ohio in its life before and could not possibly know the path. The logical question that comes up at this point is, "Isn't it possible that when the bird was being transported to Ohio it was able to record in its brain all the turns and twists that the train or automobile made? Then all it would have to do to return home is just retrace those turns and twists." Dr. Mayr describes a very novel experiment that was made in Germany to find out about this. Two darkened cages full of Starlings were carried from a German village to Berlin, ninety-three miles away. One of the two cages was mounted on a phonograph disc, which slowly turned around and around during the entire railroad journey, making a total of about 5000 rotations. The Starlings could not possibly remember all these turns in addition to the turns in the track. Still these birds returned nearly 100 per cent, and, in fact, quicker than the birds in the other cage which were transported under normal conditions without being whirled around. Birds transported under the influence of chloroform also returned home as successfully as others, another proof that conscious memory does not play a part.

Another favorite idea about homing is that birds have some sort of undiscovered organ with a magnetic sense. Home marks zero, and no matter where the bird is, it tends to be irresistibly pulled toward zero as if by a magnet. If this were true, the steel of cities, railroads and other things would throw the birds off their course, but they do not. There are other similar ideas, such as the influence of radio waves, but none of these theories has yet been proven. To this day no 'homing organ' has ever been found in the body of a bird, so the mystery is as deep as ever.



Photo by Allan D. Cruckshank

THE UPLAND PLOVER NEEDS NO COMPASS. How it finds its way from the prairies of Patagonia to the farms of the Midwest is a mystery.



Photo by Allan D. Cruickshank

THE TINY RUBY-THROATED HUMMINGBIRD weighs no more than a penny. Yet it makes a non-stop flight of more than 500 miles across the Gulf of Mexico.

Wind and Weather

Without the mysterious homing sense, bird migration would be impossible. The comparison of homing to a rubber band that has been snapped is very neat, but in their periodic migrations birds seldom travel in a straight line. Their flight is often shifted by the winds. If it were not for the northerly or northwesterly winds from inland sections, the large numbers of birds would not appear every fall at Cape May or at other famous migration points along the Atlantic coast. Birds migrate on southerly or easterly winds, too, if these are not too strong, but on such days, Cape May is often almost birdless, for the wind has come from the sea instead of the land.

The wind never *pushes* or *blows* a bird as you might think. The bird is borne along like a log in a moving current of water. An air current is not unlike a broad stream, and a bird is affected by it the way a person is when he swims across a river. If the current is strong,

he is carried down stream quite a ways. Then he has to change his course and travel upstream to reach the spot opposite which he started. Birds are carried along by breezes which sometimes greatly lengthen the distances they must travel, but they are not at the mercy of these winds unless they are of storm velocity. Should a bird go too far from its path, it will often tack against the wind, or rest a while and change its direction so that it can regain its line of flight. So then, a bird does not necessarily migrate 'as the Crow flies.' It might travel a curved or zig-zag path in the thousand miles or more between its summer and winter homes.

Aviators know a lot more about winds and air currents than most people. The weather is a major influence in their daily activities, just as it is in the life of a bird. An excellent article entitled 'Birds and the Wind' by Neil T. McMillan appeared in the November-December, 1938, issue of *BIRD-LORI*. Capt. McMillan is a commercial airline

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pilot who finds an endless source of wonder in watching Vultures and other birds, and noting how they are influenced by the elements. His article is an excellent reference for class study, and goes into much greater detail than can be done here.

How High, How Fast, How Far?

The questions most frequently asked about birds seem to be, "How far can a bird fly?" or "How high do they fly?" or "What is the fastest bird?" Nearly everyone knows about the Arctic Tern, the long-distance champion of all birds. It travels between 10,000 and 11,000 miles across the trackless ocean between its breeding islands in the North and its wintering grounds in the southern seas. That makes a minimum round-trip distance of 20,000 miles each year. There is actually a record of a young Arctic Tern banded on the coast of Labrador which was recovered a little over three months later in South Africa, a distance of 9000 miles! The Golden Plover runs the Arctic Tern a close second for the long-distance honors, traveling from the Arctic tundras to the pampas of Patagonia . . . a large part of the way over the water. Even some of the frailest land birds travel remarkable distances. The Bobolink leads these, covering a distance of 6000 or 7000 miles between the northern United States and Canada and the great prairies or *campos* of southern Brazil and the Argentine. Even the tiny Ruby-throated Hummingbird, which weighs no more than a copper penny, often travels as far as the Gulf of St. Lawrence from its winter home in the Tropics—from the land of the Parrots to the land of the Crossbills. At least 500 miles of this is a non-stop flight across the Gulf of Mexico. Considering the tiny size of a Hummingbird, this is an accomplishment that belittles the transoceanic flights of men. These long-distance champions, at least the

Hummingbird, Arctic Tern and Golden Plover, average something like 50 miles an hour in speed—perhaps more at times, but they are by no means the fastest of all birds. A flock of Swifts was seen to overtake and pass a plane traveling about 70 miles per hour (it must have been an old model), and there seems to be little doubt that these birds often travel over 100 miles per hour. The Duck Hawk is generally considered to be the fastest thing on wings, attaining speeds that have been estimated up to 175 miles per hour. This terrific speed, however, is reached only during the 'stoop' when the bird is plunging after its prey. In ordinary cruising flight the Duck Hawk probably does not do much more than 60 miles per hour, and at times less than that. Most small birds, however, fly between 20 and 30 miles per hour. In migrating they probably travel about 100 or 200 miles in a night or more, but between flights they rest for several days and build up energy for the next hop. The speed at which a bird migrates is usually more leisurely than it is at other times.

Most migration seems to be within half a mile of the earth's surface, and much of it only a few hundred feet up. Aviators rarely find birds at a height of more than a mile above the earth.

Dangers and Adventures of Migration

Migration is the greatest adventure in the life of a bird, and countless thousands never reach their destination. They do not, as some people think, foresee weather conditions like a miniature weather bureau, but are instead influenced by the weather at the point where they start. If it is favorable, off they go. They do not know, ahead of time, whether they are going to run into snowstorms, winds, or fogs. Sometimes there are fatal accidents when they meet such conditions. Winds

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carry them out to sea, sometimes so far that they are unable to regain the land. Fogs bewilder them, and not infrequently they crash into the blinding lights of lighthouses and high buildings. One catastrophe was reported where an iceshelf overtook a tremendous migration of Longspurs in Minnesota. The next day 750,000 dead Longspurs were estimated on the ice of two small lakes. Longspurs in greater or lesser numbers were recorded dead over an area of 1500 square miles. It probably took years for the Longspur population, in some localities, to build up and replace the millions of lives lost on that one night. Birds even perish at times when crossing such bodies of water as the Great Lakes. Five thousand dead birds were counted along one mile of shore on Lake Huron after a bad storm, so you can see that the cost of migration is very heavy in life. It is probably the greatest risk a grown bird must take.

Bird-Banding

During the past twenty years, well over 3,000,000 North American birds have been banded with little aluminum leg bands, each of which has a number. Out of these there have been over 200,000 'returns'—in other words, one bird in fifteen has been recorded again after it was banded. This great banding project, which is directed by the United States Fish and Wildlife Service, is at present our most important source of information about migration. Hundreds of little-known facts have been determined . . . whether birds come back to the same place each year; where they migrate; how rapidly they travel; what paths they take, and innumerable other questions. The birds are usually caught in specially made traps, are banded, and then released. To engage in this work, it is necessary to have a bird-banding permit from the Fish and Wildlife Service, Department of the

Interior, Washington, D. C. At this time, there are so many people taking part in banding that the clerical labor entailed by the incoming reports is too great for the limited office force to handle adequately. For this reason very few new permits are now being issued unless the bander lives in a place far from other banders, or is engaged in some very definite research activity. Children are denied the privilege of banding, but they are usually very interested in what it is all about. Lincoln's recent book, 'The Migration of American Birds,' tells a great deal about this fascinating subject. For classroom reading 'Bill and the Bird Bander' is just the thing. The story revolves around the boy, Bill Elliot, and his next-door neighbor, a man who devotes most of his time to banding. Gulls, Terns, Skimmers, Pelicans, Ducks and Eagles move rapidly through the delightful pages of this book. Any child in his early teens will find the story very convincing and will learn a lot about banding and migration through the eyes of young Bill.

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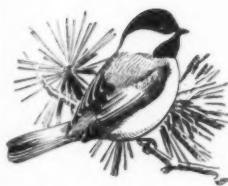
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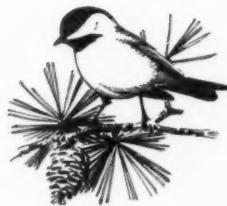
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The Director Reports to You



FOR 36 years BIRD-LORE, a name to conjure with, was published by Frank M. Chapman, than whom no man has made a greater contribution to the development of appreciation of the living bird. Through his generosity it has been the privilege of the National Audubon Society to publish BIRD-LORE during the last six years. With development of the scope of the Society's activities to cover more thoroughly the whole field of conservation of wildlife resources, it became increasingly evident that, no matter how great the good will attached to the name BIRD-LORE, it had ceased to symbolize adequately the Society's work. So, with this issue, BIRD-LORE has gone through a face-lifting treatment and appears herewith in full dress as AUDUBON MAGAZINE (formerly BIRD-LORE).

Interestingly enough, when the very first Audubon Society was formed, in New York State, through the initiative of the late George Bird Grinnell, a boyhood neighbor of John James Audubon, its official publication was titled *The Audubon Magazine* and was published under that name in 1887 and 1888. Since that day and especially, in fact, during the later years of BIRD-LORE's life, the name Audubon has acquired fame far and wide, such that it has seemed to the Directors wise to capitalize on the publicity value of that name, so appropriate for the Society's use, in aiming to develop the magazine's appeal to a far greater number of our citizens. Though the name is being changed, the size, shape, type and general character of the magazine's content will remain unaltered.

California, Here We Come!

FROM Petaluma to Laguna, industrious Bert Harwell has been on the go, day and night, since early November. Doing what? Enthusiaging those devoted to the Audubon cause, those with a full-fledged or smattering appreciation of our great outdoors; building a spirit with a will to win through to accomplishment in California's conservation of wildlife resources. And Harwell is on his way; a man liked throughout the length and breadth of the Golden State, from south to north and east to west, and right down the middle. Surely this is a tonic to all those stalwarts who have upheld the Audubon traditions and maintained our banners through the years.

A Get-Together

THE big days will be May 9 to 11, 1941. The place: Asilomar on the Monterey peninsula, where the twisting pines are silhouetted against the blue Pacific. From Friday evening through Sunday afternoon there will be a parade of Audubon events, and the biggest turnout of wildlife conservationists ever to be held west of the Rockies. All the vital wildlife preservation problems of throbbing interest will be discussed. Friendships will be renewed and made; programs invigorated and formed and happy times had together, observing nature afield. All Audubon members and their friends will be very welcome indeed, and we have every hope and confidence that many of the active spirits in Audubon groups of all the Pacific coast states will wend their way to this great regional meeting.

What did you say? Wandering Tattlers, Surf-birds, Black Oyster-catchers, and sea otters? Well, why not? It's a grand place for them. And Albatrosses? There is a good chance for those willing to brave a few hours at sea. Come one, come all; join the party!

Tours Go Peripatetic

LONG before this gossip sheet appears, the Sacramento Valley Audubon Wildlife Tours under Harwell's expert leadership will be in full sway. Six kinds of Geese, no less, to be seen. Little Brown Cranes, White Pelicans, and Ducks galore. Here, in full view of the historic mining country of the California gold rush, lie two great wildlife refuges—the Sacramento Refuge, near Willows, administered by the U. S. Fish and Wildlife Service, and the Gray Lodge Refuge near Marysville, which is the responsibility of the California Fish and Game Commission. To these and other focal points our tourists will trek by station wagon during February; entertained betweenwhiles with pictures in motion and color, with accompanying whistling and song in the Harwellian manner. It's a rare treat, not to be missed. By March 6th, Harwell will find himself transplanted to the desert, which holds so much fascination for those ornithologically 'in the know'—Vermilion Flycatchers, Cactus Wrens, Verdins, Phainopeplas, and a host of others. From Indio as a base, wide swings will be taken in and around the Salton Sea, that curious sheet of water actually below sea-level—a favorite haunt of water birds of many kinds and descriptions; through the canyons in and about top-hat Palm Springs, and way around through the Joshua Tree National Monument. The opportunity to get in on these trips will extend to April 15th. The Peck-Judah Travel Service offices in Los Angeles and San Francisco will fix you up in a jiffy.

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Coöperation with a Vengeance

IN DECEMBER you heard of the new White-tailed Kite posters, with illustration reproduced from original drawings by Roger Peterson, whose new western 'Field Guide,' by the way, should be on deck to help all those wise enough to attend the May meeting at Asilomar. Our good friend, James Moffitt, president of the Audubon Association of the Pacific, enlisted the interest of state officials in the distribution and effective placing of these posters, and a vote of thanks is certainly due W. C. Jacobsen, Chief of the Bureau of Rodent, Plague and Weed Control of the State Department of Agriculture, who wrote to 58 California county and branch agricultural commissioners, forwarding copies of our protective poster to be displayed in their offices, where many farmers will inevitably see them. Not to be outdone, L. F. Chappell, Acting Chief of Patrol of the Division of Fish and Game, wrote to all state game wardens, supplying each with one of these Kite posters, inviting attention to the exceedingly beneficial food habits of these raptors, asking that they be displayed in the most conspicuous places that the wardens might be able to select, including Duck clubs, boat landings in Kite territory where hunters and bass fishermen renting boats would see them, and at farm houses and in farm yards near which Kites nest. Our thanks to you, Messrs. Jacobsen and Chappell.

Feathers in the West

MANY years ago, when the first campaign to reduce traffic in wild-bird plumage was at its height, the San Francisco Customs turned over to the California Academy of Sciences for exhibit purposes a substantial collection of illegal feathers. With a show of rare initiative and energy, Curator of Birds Moffitt of the California Academy

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Photo by Roger T. Peterson

DIGNIFIED AND GRACEFUL. California wildlife tourists can count on seeing the White Pelican, one of the largest birds in North America, soaring on motionless black-tipped wings.

of Sciences in Golden Gate Park has prepared to stage a grand exhibit at his museum, opening February 1st and running until May 1st, vividly illustrated with pictures and sample quills and plumage and implemented with pungent phrasing, replete with essential facts. This marvelous exhibit extends over 35 feet of wall space in 8 main wall cases, $3 \times 5\frac{1}{2}$ feet each, as well as a flat, glass-topped case displaying Customs seizures of Albatross, Pelican and Egret plumage. These provide horrifying examples that the museum sincerely hopes will be remembered by spectators as a fitting conclusion to the exhibit. Space permitting, we have every intention of giving fuller treatment in

our next magazine issue to this very fine and deeply appreciated coöperation of the California Academy of Sciences in the present campaign to put an end, once and for all, to United States traffic in wild-bird plumage from any source, at any time.

Where Stands the Campaign?

AS THIS issue goes to press, members of the feather industry and the Society do seem to be on the very verge of a meeting of minds as to a joint statement. This would involve recommendations with regard to Federal and state legislation designed to put into effect the objectives of the Society, with the consent and support of the



Photo by Laidlaw Williams
A VERITABLE FORTRESS FOR A NEST. The golden-headed Verdin, one of the desert's characteristic birds, will be nest-building during the time of the California tours.

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industry. If so, a great victory will have been won. In any event our thanks go out to all that host of organizations and individuals throughout this nation who have made known to their legislators, millinery stores and friends their opposition to continuance of traffic in the plumage of wild birds. The response to our appeal has been immense and enheartening. The press has shown tremendous interest. We are well on the way, we hope and believe, to a permanent solution.

The Situation Is Complex

JUST picture this. Some of the wild-bird plumage in current inventories of dealers, manufacturers and jobbers was imported prior to the passage of the restrictive provisions of the Federal Tariff Act in 1913, and even prior to the restrictive New York State legislation in 1910. As to such inventories, the owners possess constitutional rights. Then, again, the Treasury Department has see-sawed up and down dale in its decisions as to the rating of sundry birds as domestic, or domesticated, in character; and constitutional rights are possessed with regard to considerable wild-bird plumage inventories imported as recently as 1933. True, proof is said to be lacking as to the dates of importation of much wild-bird plumage claimed to have been legally imported, and there are, perhaps, some legitimate reasons why this may be so. Other portions of the existing inventories have been illegally imported or offered for sale; some of this has already been seized by the Bureau of Customs and confiscated; other portions have been seized by other enforcement agencies. Well over a million Albatross quills, we are informed, have been seized by the Bureau of Customs as result of information given to it by our Society. These feathers came in as

'domestic goose' feathers, and were offered for sale as 'Chinese Pelican.'

Violations Real

IN OUR campaign pamphlet, 'Mas-sacred for Millinery,' it was pointed out that a loophole in the Federal Tariff Act permits importation of wild-bird plumage for tied fish flies and that this had opened an avenue for illegal diversion of such plumage to millinery use. Proof of such instance is now in the possession of the Bureau of Customs; the inventory involved has been confiscated and penalty assessed. Feathers of Bald and Golden Eagles, as well as Magpies, have been found on sale in retail stores in all principal cities of the country where checks have been made to date by enforcement agents, with the assistance of Richard Pough as an expert in the identification of plumage; the resulting cases for prosecution are in the hands of District Attorney Dewey of New York County.

We wish to express our appreciation here and now to the Commissioners of Conservation and the Directors of Divisions of Fish and Game in New York, Pennsylvania, Maryland, Ohio, Michigan, Indiana, Illinois and Missouri for their coöperation in this campaign, through instructing their agents to check retail stores as to the legality of offerings for sale of millinery trimmed with feathers or other plumage.

Our thanks are due, also, to officials of the U. S. Fish and Wildlife Service and the office of the Collector of Customs at the Port of New York. Special mention, we feel, should be accorded the personnel of the Department of Conservation of the State of New York and their counsel of the New York Law Department, who have been unfailing in their energetic enforcement of the existing law, and in attempts to bring to successful conclu-

sion negotiations as to new legislation designed to accomplish our objectives.

Legislative Action Coming

THE principal key to the legal remedies lies in New York State, where buyers of millinery concentrate, where the importers, manufacturers and jobbers in the feather industry have their businesses, and where the importations of wild-bird plumage in large measure take place. Once model plumage law be enacted in New York, the major battle will have been won, but it is essential that every effort be made to have said model legislation enacted in each of the forty-eight states, the territories and the District of Columbia. All coöoperating individuals and organizations will be promptly advised at the earliest possible date as to the part they may well play in obtaining such legislative enactments.

Throngs at Florida Capes

IN LATE October, just before the opening of the Duck hunting season, with its disturbing bang-bang-bang, Alex Sprunt, Jr., found a thrilling sight on the flats near East Cape Canal at the very southwesternmost tip of Florida.

"As we ran up the canal from the bay," wrote Sprunt, in his characteristic style, "the bird life began to make itself evident. There were Great Whites along the banks of the canal which did not even fly as the boat passed within a few yards. This was the first time I ever saw the species as unconcerned as they were. Herons, Wood Ibises and many shore birds were flying about, and feeding in the hurricane-killed mangrove forest which lies on either side. As we came up to the fish camp itself, a flock of Spoonbills appeared on the west side of the canal, some feeding on the mud, others perched in the dead mangroves, all of them utterly unconcerned about the boat.

"As sunset approached, the birds began to come in more and more. Great flocks of shore birds, Sandpipers, Willets, Yellow-legs and Plover swept down the canal, wheeled over the flats and fed along the banks at a range of only a few yards. Looking through the dead mangroves eastward, where the land is open, there appeared to be snowbanks spread over the flats, these being great bands of Herons, Egrets, and Wood Ibises. There are four large roosts in the close vicinity, two of them being immediately adjacent to the fish camp. One was on the east side of the canal about halfway between the fish house and the mouth of the canal.

"One could stand on the bank and throw a baseball into the middle of the roost. Egrets were pouring into it like water from a funnel. Great squadrons would come in from the north and, sailing high up, would descend in dives, sideslips and plunges which filled the air with a roar of wings. Another roost was just over on Whitewater Lake, a few hundred yards to the west. About 90% of the birds in each were 'Long Whites.'

"It was, however, the Spoonbills and their actions which were most amazing. As we sat out on deck a band of 26 came in, walking through the mangroves to the canal bank, and began to feed along it, going up actually under the hanging nets which the fishermen were drying out next to the camp. Some of them fed up in the shallows and gutters to within a few feet of the back door of the house. There were two boats trying out their engines, and every now and then, there would be a sudden roar from a motor, at which the Spoonbills would pay no attention at all."

Willkie or Roosevelt—It's All the Same

UNDETERRED by the tense national excitement of Election Day, Spoonbills in south Florida began pairing on



Photo by Allan D. Cruickshank

WHITE WINGS AGAINST A BLUE SKY. Today, the American Egret is common in Florida, due largely to the protection offered them by Audubon wardens.

November 6th, this past fall. Bob Allen was there as a witness, for he's seldom anywhere else nowadays, since he undertook to become the legal guardian of the elusive 'Pink Curlews'—responsible for them but with no control over their actions. A nice job; and, besides that, he undertakes to be their historian and daily diarist.

The courtship of Spoonbills in Florida has probably never been observed in its entirety. Probably Allen—whose new title is Research Associate, by the way—has seen as much of it as anyone ever

has. And that isn't much, for two reasons. For one thing, the rites are celebrated behind a jungle screen of intricate and evergreen mangrove foliage. For another, the last thing he wants to do is to discourage the course of true love by being a buttinsky.

Blessed Event

ALLEN had been on the Spoonbill nesting ground almost six weeks before he could flash the word, on December 18, that the first young 'Pink' had hatched the day before. All told, as



Photo by Alexander Sprunt, Jr.

ALLEN'S HOME IN THE WILDERNESS. *The Spoonbills that dropped in to feed were not at all concerned by the construction of his new camp.*

many as 75 adult Spoonbills had been hanging around, arousing hopes of upwards of 35 occupied nests on the key. Allen had observed in Texas that it took 41 days from the pairing of the adults to the hatching of the egg, and the Bottleneck Spoonbills met all expectations as neatly as if they were operating on a rigid time schedule. That makes six weeks, practically, during which it is all-important that the adults shall not be disturbed. For that matter, it seems wise to avoid, for some little time thereafter, any risk of disturbance of the newly hatched chicks or touchy proud parents, even for the collection of the most vital scientific facts.

Majestic Trenchermen

ON THE last day of 1940, Bob Allen stretched out on the ground to watch the feeding activities of 'the pink bird from the Pleistocene.' The Spoonbills knew he was there, but they no longer showed much consciousness of his presence, and they were undoubtedly

acting perfectly normally as they worked back and forth over the mud flat, swinging their bills in wide arcs, and running now and then to keep up with a school of fleeing killifish. Sometimes they assisted their running with majestic wing-flappings, showing the resplendent rosy pink of the under wing-surfaces and the intense carmine of the upper tail-coverts. In the failing sunset light, Allen could still make out their bright red eyes, and the yellowish suffusions on the sides of the breast. Near-by fed a Great White Heron, deliberate of step, but swift as he stabbed efficiently at a fish or shrimp. A Reddish Egret and a Black-bellied Plover joined the august company.

For what is perhaps the second time in ornithological history, Allen witnessed the spectacle mentioned by Audubon, who saw Spoonbills in Florida over a century ago. And that is the habit of the Pinks of feeding with heads submerged. Few have mentioned it since, upon personal observation.

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What is striking about the Spoonbill's food habits is that most of its feed is very small. This means that it takes hours to secure a full belly, and hours—five of them—is just what the birds had taken, that last day of 1940.

At the start of his study, Allen thought that the little horn shell, *Cerithium*, would prove, from its abundance in the feeding flats, and on the analogy that it is a favorite food of the Flamingo, to be a crucial diet item. He's not so sure of this now; on the contrary, he's backing killifish.

Key Industry Discovered

WHERE the Pinks had been feeding, Allen found the opaque shallow water alive with the killifish, *Cyprinodontes*. Studies leave no doubt now that this is a chief, perhaps an all-important, article of Spoonbill diet. Killifish are a 'key industry' in Allen's problem, and he finds that Louisiana Herons, Willets, and other birds, feed on them too. So the Spoonbill has competitors.

Down along East Cape in Florida, Warden Blanchard and Allen found that in the very roadside ponds and puddles, where Spoonbills often feed, every dip of the seine brought forth quantities of killifish. Whether the water was a tidal slough or a roadside puddle, whether cool open water, or registering 85° F., always killifish were present. An adaptable organism, if ever there was one. And probably nothing less than an adaptable and abundant organism will suffice as the *piece de résistance* on the bill-of-fare of so wide-ranging and big a bird as the Pink Curlew.

Gales Sweep Rookery

JUST before 1941 took over the almanac, a sou'easter kicked up. The weather bureau ran up storm warnings, and small craft scuttled for harbor. But Spoonbills can't read man's weather signals, and they wouldn't have any

way to transport their eggs and babies if they could read. And that's how disaster hit the nesting colony, with high gales and rain and a sudden deep drop in the temperature. It was hard for the friends of the Spoonbills to know that fledglings might be getting drowned out, young and eggs fatally chilled, and adult birds scattered on the wind, at the most critical moment of their breeding cycle. But there was nothing one could do to help.

When the storm abated, the full measure of the calamity was soon revealed. There were dead young in three nests, a total of eight cases of infant mortality, and deserted eggs in seven nests. This left only five nests with living young—eleven surviving, all told. And what a shock to find only fifteen nests in all, as against the anticipated thirty-five! At least forty adult Spoonbills were missing. By boat, a swift reconnaissance was made. No Pinks on any adjoining keys. Only some thirty birds left, plus the eleven babies.

Last year it was apparently raccoons, who climbed the trees and ate the eggs. This year it's high gales, with chilling rain. "Probably," says the patient Allen, "it's just as well to have seen the colony at its worst! There aren't many other evils that can befall our charges—we hope."

Bombing in the Wilderness

SPOONBILLS are getting used to Man. Or, at least, to officers and employees of the National Audubon Society. In less than a month after Allen's return last fall to a near-by key, they were dropping in to feed, quite unconcerned by the pilings and other lumber of the camp, and feeding right up to it. Allen's presence a short distance away in the skiff seemed to disturb them not at all. And the whacking and hammering of construction work

worried them a lot less than Allen was worried when army bombers began dropping sand bags in the bay and a far-off stuttering, suspiciously like machine-gunning, came down the wind. Reminder to the Air Corps that the Society has a sanctuary in this area has gone out to General Arnold. We're afraid we can't manage air-raid shelters for the birds.

Whirlwind Advance of Science

THE Spoonbill Museum' might presently be the name of the Allen study collection down on Florida Bay. And there will be everything in it—except Spoonbills. Jars and jars of fish, gastropods and isopods, and molluscs and 'shell fish' generally. Anything which Spoonbills are known to eat, seem very likely to eat, or might possibly eat, will be represented. An herbarium of plants growing where the Pinks nest, in water or out. Maps, charts, graphs and diagrams. That's the way science has to proceed. Omitting no possibility, accounting for even the apparent 'impossibilities.' Truly said Tennyson: "Science moves but slowly, creeping on from point to point."

Now You See Them and . . .

EVERY Tuesday and Friday during February and March authorized visitors are taken out for a 'look-see' in the Society's boat by Warden Ed Moore. In the three- to four-hour outing Spoonbills are apt to be seen, together with Man-o'-war-birds, Brown Pelicans, Great White Herons and, just perhaps, a Reddish Egret or two. There is a stop at Allen's camp for a field lecture on the Spoonbill situation. You might see terrapin for the first time outside a Baltimore stew, and crocodiles if Allen can catch one. But the Pink Curlews aren't promised, even for a glimpse, any more than the rubber-

neck bus driver in Hollywood promises you, when he drives you past the stars' houses, that the stars will come out and twinkle at you just at that moment.

Help for the White-winged Dove

THIS exquisite migratory Dove, a favorite game bird in that small portion of the United States into which it ventures, is in an increasingly bad way. Biologist Johnson A. Neff of the U. S. Fish and Wildlife Service has made a particular study of the predicament of this bird in its Arizona habitat, just this side of the Mexican line. A. A. Nichol, when acting as Audubon Research Fellow on the desert bighorn sheep project a couple of years ago, reported vividly on the destruction of these birds, especially in and around Ajo, where the miners were wont to hide near water holes and pick off bottles, Doves, or anything else that moved, in season and out. Biologist Neff has published his findings, portraying a condition so severe that surely nothing but a period of closed seasons will suffice to restore this species in Arizona. Fortunately there is evidence that leading sportsmen in that state are aware of the need of such action. Our Society has made urgent recommendations to the U. S. Fish and Wildlife Service that there be a period of closed seasons on this species in Arizona.

In south Texas this Dove has fared somewhat better, but Warden Larson of Harlingen writes that he has personally seen these Doves "reduced from swarms to what looks now like stragglers in comparison." We are very glad to report that the U. S. Fish and Wildlife Service and the Texas Fish, Game and Oyster Commission are showing a lively interest in this matter, and there is reason to expect that new regulations will considerably reduce hunting opportunity as regards the White-winged

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Photo by Allan D. Cruickshank

CALAMITY HAS AGAIN STRUCK THE FLORIDA SPOONBILLS. Nesting failed last year because of apparent predation by raccoons, and this year because of heavy rains and high gales.



Photo by Allan D. Cruckshank

ITS CENTER OF ABUNDANCE IS ON FLORIDA'S KISSIMMEE PRAIRIE.
Here, on the open prairie, the sight of a Caracara is promised to wildlife tourists.

THE DIRECTOR REPORTS TO YOU

Dove in Texas. We have particularly urged that the season be shortened; that the shooting days allowed, if any, be consecutive and not staggered, though with Sundays excluded; and that hunting be limited to afternoon hours. At least 50% of the kill, according to Warden Larson, occurs on Sundays. The 1940 open seasons were August 16 to September 15 in Arizona; September 1 to October 31 in northern and central Texas counties, and September 15 to November 15 in the remainder of that state. The bag limit was 12 in the aggregate of Mourning and White-winged Doves.

Muscongus Aboy!

THE Audubon Nature Camp will again enjoy this coming summer, in its sixth season, the direction of Carl W. Buchheister, and it is with pleasure that we announce that the entire 1940 camp teaching staff will be with us. There will be five two-week sessions, as usual, the first beginning June 13 and the last ending August 28. It is none too soon to make your plans to attend.

That new building, with its big open fireplace, shelving for library and comfortable layout for use as a social center, as well as for evening lectures, will, we sincerely hope, be finished and ready at the time this year's camp opens in June. Former campers will be glad to know that contributions to date to finance this new building total over \$1200, or a little more than one-half of the \$2400 which will be required to cover the cost of construction. We are deeply grateful to all those who have so generously chipped in. If each former camper who has not yet found opportunity to do so were to send us \$2, we would go over the top and get construction under way.

Real help at no cost may be given us by members, as well as former campers, through sending us the names and

addresses of persons who seem particularly well qualified to get the most out of a happy and instructive two weeks at the Audubon Nature Camp in 1941.

Merited Recognition

IF EVER there was a man who could spot and identify all known subspecies at ultimate range, that man is Ludlow Griscom of the Museum of Comparative Zoölogy at Cambridge. As an old friend of many of the Directors and members of the staff of the Society, as one with a deep interest in the preservation of wildlife, as well as in ornithology and botany, Griscom has given generously of his time and advice to affairs of the National Audubon Society, of which he is at present the Advisory Board representative from Massachusetts. In late years he has edited regional reports from the New England states in 'The Season,' and still more recently has contributed a two-page digest of all regional field reports under title of 'The Changing Seasons.' It is with the greatest pleasure that we announce his acceptance of the title of Contributing Editor of AUDUBON MAGAZINE, and the responsibility for policy and direction in the organization, acquisition and presentation of 'The Season' data beginning with the March-April, 1941, issue.

Still on the Up-Grade

YOUNGSTERS throughout the nation, war or no war, continue to join our Junior Clubs in ever-growing numbers. At last accounts, there were 7500 more of them enrolled than as of the same time in the preceding school year. We wonder if many members realize that, for a couple of years now, the Society has been publishing a special news sheet for the Junior Clubs, entitled *News on the Wing*. This gives us a chance to concentrate in that Junior



Photo by Alexander Sprunt, Jr.

Audubon wildlife tourists investigate a Caracara nest in a cabbage palmetto.

paper the kind of news and information of particular interest to the youngsters. Still another advantage is that it takes that kind of material out of AUDUBON MAGAZINE, where it would be, inevitably, somewhat of a misfit.

As for adult membership, it is cheering to know that, in spite of the increased demands for financial aid consequent upon the terrifying conditions in Europe, the Society's dollar receipts from membership dues stick to the upward curve. The last figures—those for the month of December, 1940—show a 14% increase over December, 1939, and 20% increase over December, 1938.

Okeechobee Lures

THE 1941 Okeechobee-Kissimme Audubon Wildlife Tours are going strong. Here was a brand-new venture a year ago, happily well-patronized by enthusiastic members and friends of the Society. So favorable were the results that, this winter, we are experimenting with doubled capacity, with Alexander Sprunt, Jr., whose new title is Southern Representative of the National Audubon Society, and Alden H. Hadley, our Florida Educational Representative, as twin leaders. A year ago it was largely guesswork as to what the results would be. As we go to press, 101 persons have already enrolled, prior to the opening date, as participants in these February-March Florida tours. Not only do the tourists have opportunity to observe strange birds and other wildlife in unfamiliar surroundings under expert guidance, but the tours serve to bring business to pioneer communities and to educate the citizens thereof to the values of wildlife. The tourist's appreciation of the beauty and economic value of wildlife is stimulated, as is his action to preserve and protect it. He learns that a fundamentally valuable, destructible and irreplaceable asset is being depleted for selfish reasons, both for sport and profit. He learns that thousands, if not hundreds of thousands, of Federal and state construction projects are approved and carried out without the slightest consideration of the biological consequences. It is borne in upon him that such projects have been a primary factor in the wastage of our natural assets. He learns that preferential interest is often a murderous thing, resulting in much willful destruction, upsetting to the natural biological balance. He realizes that there is a great deal still to be learned before man can successfully determine just what he may best do to restore and maintain natural biological balance for his own greatest economic benefit.